Tionscadal Soláthair Uisce
Water Supply Project

# Application for Derogation Under Regulation 54 of the European Communities (Birds & Natural Habitats) Regulations 2011, as Amended - Disturbance to Bats

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# Application for Derogation Under Regulation 54 of the European Communities (Birds & Natural Habitats) Regulations 2011, as Amended – Disturbance to Bats

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NPWS licence DER/BAT 2025-171 (Survey licence, expires 31st December 2025).

**Statement of Authority:** Dr Aughney has worked as a Bat Specialist since 2000 and has undertaken extensive survey work for all Irish bat species including large scale development projects, road schemes, residential developments, wind farm developments and smaller projects in relation to building renovation or habitat enhancement. She was a monitoring co-ordinator and trainer for Bat Conservation Ireland for 20 years. She is a co-author of the 2014 publication *Irish Bats in the 21st Century.* This book received the 2015 CIEEM award for Information Sharing. Dr Aughney is a contributing author for the Atlas of Mammals in Ireland 2010-2015. She is a trained bat handler, bat ringer and radio-telemetry project manager. She is a member of the Nathusius' Pipistrelle Working Group and the Cavan Bat Group.

All analysis and reporting is completed by Dr Tina Aughney. Data collected and surveying is completed with the assistance of trained field assistants. Mr. Shaun Boyle (Field Assistant) NPWS licence DER/BAT 2025-172 (Survey licence, expires 31st December 2025). Ms. Eva Boyle (Field Assistant) NPWS licence DER/BAT 2025-173 (Survey licence, expires 31st December 2025). Both field assistants have received in-house training to undertake all elements of bat surveying according to Collins (2023).

**Client:** Uisce Éireann

**Project Name & Location:** Water Supply Project Eastern & Midlands Region

Application for the Derogation Under Regulation 54 of the European Communities (Birds & Natural Habitats) Regulations 2011, as amended – Disturbance to Bats

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# Contents

**Acronyms and Abbreviations** ..... iii

**1. Introduction** ..... 1

1.1 Need for the Proposed Project ..... 2
1.2 Statement of Authority ..... 3

**2. Proposed Project Description** ..... 4

**3. Methodology** ..... 6

3.1 Desktop Review – Bat Conservation Ireland Database ..... 6
3.2 Survey Methodology ..... 6
3.2.1 Daytime Inspections ..... 7
3.2.2 Night-time Bat Detector Surveys ..... 7

**4. Results** ..... 8

4.1 Desktop Review – Bat Conservation Ireland Database ..... 8
4.2 Survey Results ..... 9
4.2.1 Building 1 ..... 9
4.2.2 Tree Roosts ..... 13

**5. Examination of Impacts and Assessment of Alternatives** ..... 18

5.1 Potential Impacts ..... 18
5.2 Proposed Mitigation Measures ..... 19
5.2.1 Alternative Bat Roost ..... 19
5.2.2 Demolition – Building 1 ..... 29
5.2.3 Bat Box Scheme – Alternative Roosting for Tree Roosts ..... 29
5.2.4 Trees ..... 29
5.2.5 Monitoring ..... 30
5.3 Assessment of Alternatives ..... 31
5.3.1 Proposed Project Alternatives ..... 31
5.3.2 Do-Nothing Scenario ..... 35

**6. Conditions for Derogation Licence** ..... 36

6.1 Test 1 – Reason(s) for Seeking Derogation ..... 36
6.2 Test 2 – There is No Satisfactory Alternative ..... 37
6.3 Test 3 – Favourable Conservation Status ..... 37
6.3.1 Lesser Horseshoe Bats ..... 37
6.3.2 All Other Bat Species ..... 39

**7. Conclusions** ..... 42

**8. Bibliography** ..... 43

**Annex A** ..... 45

Effectiveness of Bat Boxes as a Mitigation Measure ..... 45
Bat Houses ..... 48
Bat Eco Services Evidence ..... 48
VWT Pump House ..... 49

## Acronyms and Abbreviations

| Acronym | Meaning |
|---|---|
| BCIreland | Bat Conservation Ireland |
| BPS | Booster Pumping Station |
| BPT | Break Pressure Tank |
| CIEEM | Chartered Institute of Ecology and Environmental Management |
| FCV | Flow Control Valve |
| GDAWRZ | Greater Dublin Area Water Resource Zone |
| MCA | Multi-Criteria Analysis |
| NPWS | National Parks and Wildlife Service |
| NWRP | National Water Resources Plan Framework Plan |
| PBR | Potential Bat Roost |
| PRF | Potential Roost Feature |
| RWI&PS | Raw Water Intake and Pumping Station |
| RWRM | Raw Water Rising Mains |
| RMRPs | Regional Water Resources Plans |
| SAC | Special Area of Conservation |
| TPR | Termination Point Reservoir |
| VWT | Vincent Wildlife Trust |
| WRZ | Water Resource Zone |
| WTP | Water Treatment Plant |

# 1. Introduction

1. A derogation licence is requested in relation to the disturbance of bats during the construction of the proposed Water Supply Project Eastern and Midlands Region (hereafter referred to as 'the Proposed Project').

2. The Proposed Project is a water supply pipeline involving the abstraction and pumping of raw water from the Lower River Shannon at Parteen Basin; treatment of the water nearby at Birdhill, County Tipperary; and pumping of the treated water to a high point near Cloughjordan, County Tipperary and on through the Midlands to a termination point at Peamount, in County Dublin (within the administrative area of South Dublin County Council), where it would connect into the existing Greater Dublin Area Water Resource Zone (GDA WRZ) network.

3. The objectives of the Proposed Project, taking account of the Regional Water Resources Plan (RWRP) Eastern and Midlands (Irish Water 2022) (see Section 1.1), are to:
   - Provide a sustainable water supply from a New Shannon Source
   - Address critical supply issues in the Greater Dublin Area with provision for future supplies to multiple Water Resource Zones (WRZs) in the region
   - Increase resilience of supplies and Levels of Service (the reliability of the supply that Uisce Éireann customers can expect to receive)
   - Deliver a flexible, future-proofed solution that is responsive to change.

4. Lesser horseshoe bat (*Rhinolophus hipposideros*) is listed on Annex II and IV of the EU Habitats Directive (92/43/EEC). All other bat species in Ireland are listed on Annex IV of the Habitats Directive. The directive has been transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011), as amended (the 'Habitats Regulations'). Annex IV of the Habitats Directive gives strict protection to these species of bat and their breeding and resting places (roosts).

5. This document provides supporting information required for the application of a derogation licence under Regulation 54 of the Habitats Regulations, including desktop review and ecological survey results. The document assesses the three pre-condition tests set out in Regulation 54 (National Parks and Wildlife Service (NPWS) 2025):
   - Test 1: the derogation is required for one or more of the specific reasons set down in Regulation 54(2) (a)-(e)
   - Test 2: there must be no satisfactory alternative
   - Test 3: the derogation is not detrimental to the maintenance of the populations of the species concerned at a favourable conservation status in their natural range
   - The European Commission (2021) guidance advises that the principle of proportionality should be applied when determining if an application passes each Test. It states, '*As a general rule, the severity of any of the conditions or 'tests' will increase with the severity of the potential impact of a derogation on a species or population*'.

6. One building, proposed to be demolished, was recorded as a bat roost (daytime and night-time roosts for lesser horseshoe bat, Natterer's bat and brown long-eared bat). In addition, four tree roosts, recorded as bat roosts, are proposed to be felled for soprano pipistrelle (day roost and satellite roost), common pipistrelle (satellite roost) and Natterer's bat (day roost).

7. This document has been prepared by a suitably qualified and experienced bat ecologist.

## 1.1 Need for the Proposed Project

8. Safe, secure, resilient, and sustainable drinking water supplies are essential to public health, social and economic growth. With climate change and population growth there are increasing pressures on existing supplies. There is already a deficit in supplies in the Greater Dublin Area and the wider Eastern and Midlands Region and this will only increase in the future.

9. The River Liffey currently provides approximately 85% of source water to the GDA WRZ and there is almost no spare capacity in the current supply. Being heavily dependent on one source for the majority of water supply in the GDA WRZ means that there is very limited resilience within the existing system.

10. In Spring 2021, Irish Water (now Uisce Éireann) published the National Water Resources Plan Framework Plan (NWRP). The NWRP sets out how Uisce Éireann will balance the supply and demand for drinking water over the short, medium and long term. The 25-year strategy aims to ensure the supply of safe, sustainable, secure and reliable drinking water in Ireland.

11. The NRWP consists of:
    - The NRWP Framework Plan (the 'Framework Plan') which set out the approach to identifying water supply needs and quantifying those needs up to the year 2044 which, following public consultation, was finalised and adopted in Spring 2021
    - Four Regional Water Resources Plans (RWRPs) to identify the optimal technical solutions (the 'Preferred Approaches') required to address the needs outlined in the Framework Plan.

12. The Framework Plan identifies how Uisce Éireann assesses needs across water supplies and the process Uisce Éireann will use to find solutions to address those needs. The Framework Plan identified, at a national level, that a new sustainable source of water is necessary to augment supplies in the Eastern and Midlands Region to address deficits in supply, increase the reliability of the current water supply system, and support future growth now and into the future.

13. The RWRP – Eastern and Midlands Region (the 'Eastern and Midlands Plan') is the RWRP relevant to the Proposed Project. The Eastern and Midlands Plan was adopted by Uisce Éireann in Autumn 2022 following public consultation, and applied the methodologies set out in the Framework Plan to identify the water supply needs of the Eastern and Midlands region and develop the preferred approaches to resolve them.

14. The Eastern and Midlands Plan identified that a New Shannon Source with transfers was the Preferred Approach to address the need of the GDA WRZ. Having identified the New Shannon Source as the Preferred Approach to meet the deficit in the GDA WRZ, the Eastern and Midlands Plan identified a 'Water Supply Area[1]' consisting of additional WRZs along the length of the pipeline and also adjacent to the GDA WRZ which had a deficit that could also be met from the New Shannon Source.

15. This establishes the need for the Proposed Project as it would deliver a New Shannon Source to provide the capacity to meet the deficit in the GDA WRZ and provide for potential future connections into 18 other WRZs in the Eastern and Midlands Region (once future projects are brought forward). This would allow those 18 WRZs to be consolidated into four new WRZs. It would also facilitate the potential future supply to 17 other WRZs adjacent to the GDA WRZ through the re-distribution of supply within the GDA WRZ and an expansion of the GDA WRZ by incorporating these WRZs into the GDA Regional WRZ (once future projects are brought forward). As a result, the Proposed Project aligns with, and is a significant step towards delivering, the Preferred Approach set out in the Eastern and Midlands Plan for a New Shannon Source with transfers.

[1] The Water Supply Area is an area defined by the infrastructure and transfer pipeline, where the proximity of treated water supplies from the Proposed Project offers opportunities for potential future consolidation of existing smaller and more vulnerable public water supply schemes, in a resilient, well-supported configuration. Potential future connecting infrastructure would be subject to separate consenting processes.

16. The Proposed Project infrastructure would provide the capacity to meet the needs of a Water Supply Area consisting of 36[2] WRZs across the Eastern and Midlands Region. This aligns with the Eastern and Midlands Plan. It would do this by providing the capacity to supply up to 300Mld (megalitres per day) which would:

- Immediately meet the identified need for water within the GDA WRZ to 2050 and beyond
- Enable the future supply to 17 other WRZs by re-directing supplies within the GDA WRZ and expanding the GDA WRZ by incorporating these WRZs into the GDA Regional WRZ, when future projects are brought forward by Uisce Éireann
- Enable the future supply to a further 18 WRZs across the Midlands from Potential Future Connection Points along the pipeline and facilitate the consolidation of those WRZs into four new WRZs, when future projects are brought forward by Uisce Éireann
- Make provision for potential reductions in existing supply volumes due to sustainability requirements anticipated under the new abstraction licensing regime.

## 1.2 Statement of Authority

17. In preparation for this report, an array of surveys have been undertaken since 2019. These surveys were completed by Bat Eco Services Ltd., under the guidance of the principal bat specialist, Dr. Tina Aughney.

18. Dr. Aughney has worked as a Bat Specialist since 2000 and has undertaken extensive survey work for all Irish bat species, including large scale development projects, road schemes, residential developments, wind farm developments and smaller projects in relation to building renovation or habitat enhancement. She was a monitoring co-ordinator and trainer for Bat Conservation Ireland for 20 years. She is a co-author of the 2014 publication *Irish Bats in the 21st Century.* This book received the 2015 CIEEM award for Information Sharing. Dr Aughney is a contributing author for the Atlas of Mammals in Ireland 2010-2015. She is a trained bat handler, bat ringer and radio-telemetry project manager. She is a member of the Nathusius' Pipistrelle Working Group and the Cavan Bat Group.

19. All analysis and reporting was completed by Dr. Tina Aughney. Data was collected and surveying was completed with the assistance of trained field assistants: Mr. Shaun Boyle (Field Assistant) NPWS licence DER/BAT 2025-172 (Survey licence, expires 31st December 2025), and Ms. Eva Boyle (Field Assistant) NPWS licence DER/BAT 2025-173 (Survey licence, expires 31st December 2025). Both field assistants have received in-house training to undertake all elements of bat surveying according to Collins (2023).

[2] 37 WRZs were identified in the Eastern and Midlands Plan consisting of the GDA WRZ and 36 other WRZs. Subsequently Barndarrig WRZ and Redcross WRZ have been rationalised and combined and so the total is now 36 WRZs consisting of the GDA WRZ and 35 other WRZs.

## 2. Proposed Project Description

20. The Proposed Project would comprise an abstraction of raw water from the Lower River Shannon and various elements of water supply infrastructure, which would extend from Parteen Basin in County Tipperary, through the Midlands, to Peamount in County Dublin. The Proposed Project would:

- Abstract water from Parteen Basin at the Raw Water Intake and Pumping Station (RWI&PS) which would be located on the Lower River Shannon downstream of Ballina/Killaloe in County Tipperary/County Clare
- Pump the abstracted water from Parteen Basin 2km to a Water Treatment Plant (WTP) at Incha Beg, County Tipperary, via twin Raw Water Rising Mains (RWRMs)
- Transfer the treated water by pumped and gravitational Treated Water Pipeline sections via a Break Pressure Tank (BPT) near Cloughjordan, County Tipperary, and a Booster Pumping Station (BPS) east of Birr, County Offaly
- The flow would be controlled by a Flow Control Valve (FCV) located in the townland of Commons Upper in County Kildare, before travelling onwards to a Termination Point Reservoir (TPR) in County Dublin (within the administrative area of South Dublin County Council).

21. The six 'Infrastructure Sites' within the Proposed Project referred to hereafter are:

- The RWI&PS, which would be located on a permanent site of approximately 4ha, on the eastern shore of Parteen Basin in the townland of Garrynatineel, County Tipperary
- The WTP, which would be located on a permanent site of approximately 31ha at Incha Beg, County Tipperary, 2.6km north-east of the village of Birdhill, and 2km east of the proposed RWI&PS
- The BPT, which would be located on a permanent site of approximately 7ha, in the townland of Knockanacree, County Tipperary
- The BPS, which would be located on a permanent site of approximately 2.6ha in the townland of Coagh Upper, County Offaly
- The FCV, which would be located on a permanent site of approximately 0.5ha in the townland of Commons Upper in County Kildare
- The TPR, which would be located on a permanent site of approximately 8.3ha adjacent to an existing treated water reservoir at Peamount, County Dublin, and would have capacity for 75Ml of treated water supply.

22. There would also be uprated or new electrical connections to provide power supplies to the Infrastructure Sites. Any new electrical works would be delivered by Electricity Supply Board Networks.

23. The RWRMs and Treated Water Pipeline referred to hereafter comprise the following:

- The RWRMs would be twin 1,500mm nominal external diameter underground transfer steel pipelines which would carry the raw water pumped from the RWI&PS for approximately 2km to the WTP
- The Treated Water Pipeline from the WTP to the BPT refers to the single 1,600mm nominal diameter steel pipeline, approximately 37km long, which would deliver the treated water pumped from the WTP site to the BPT
- The Treated Water Pipeline from the BPT to the TPR refers to the single 1,600mm nominal diameter steel pipeline, approximately 133km long, which would deliver treated water from the BPT to the TPR[3].

[3] A combination of pumping and gravity would be used to transfer water through the pipeline. Water would be pumped from the RWI&PS to the WTP and from the WTP to the BPT which is the high point along the pipeline. From the BPT, the water would usually flow by gravity along the remaining 133km to the TPR. However, at times when the volume of water needed is higher than approximately 165Mld, the water would be pumped through the whole length of the pipeline. The BPS provides the capacity to do this additional pumping when it is required.

24. The Construction Working Width, which would be temporarily required for the period of construction of the RWRMs and Treated Water Pipeline, would generally be 50m wide but would be locally wider near features such as crossings, access and egress points from the public road network and Pipe Storage Depots.

25. There would be a 20m Permanent Wayleave within the Proposed Project, normally positioned centred on the pipeline, where Uisce Éireann would retain rights of access for inspection, operation, maintenance and repair of the RWRMs, Treated Water Pipeline and associated infrastructure.

26. The Construction Phase would require additional temporary land-take for the following:

- Construction Compounds, which would be temporarily required to facilitate the works to construct the Proposed Project
- Pipe Storage Depots, which would be temporarily required to augment those Construction Compounds and would serve the installation of pipeline between the WTP and the TPR.

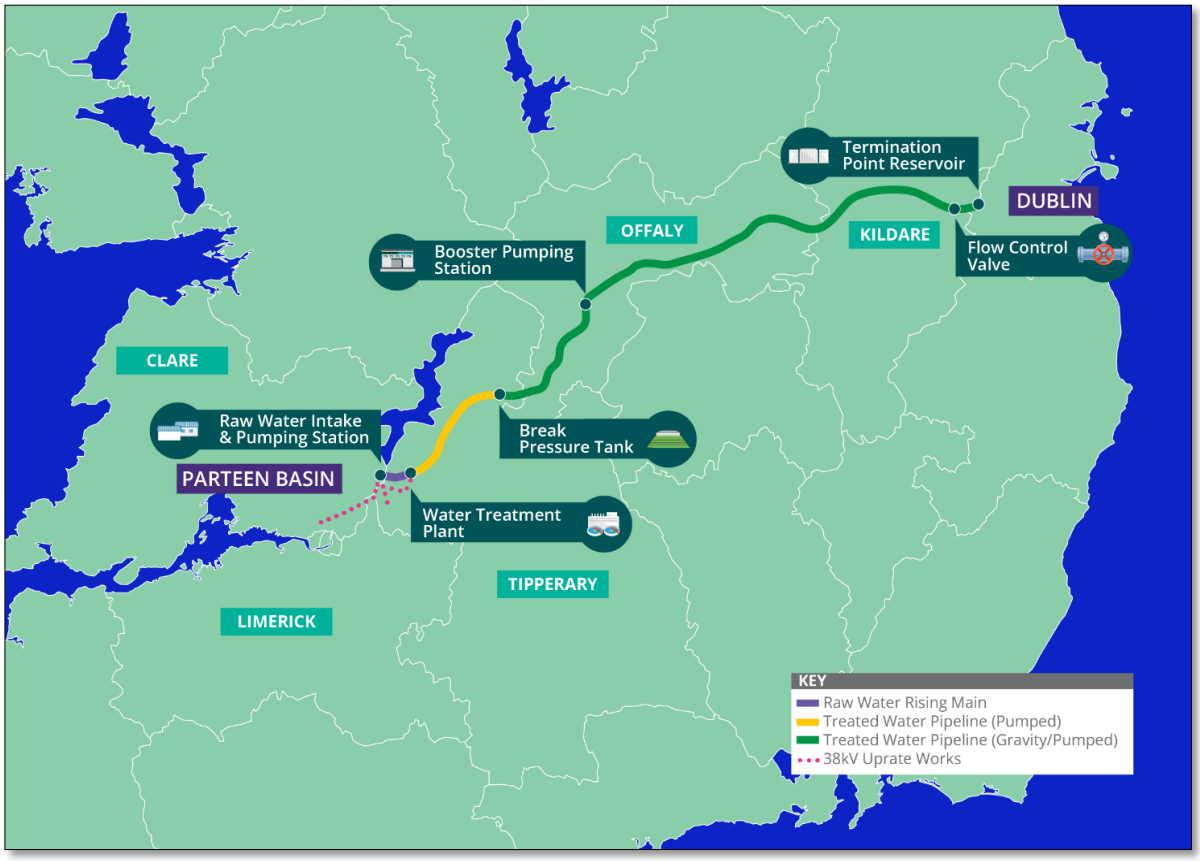


**Figure 2-1: Graphical Overview of the Proposed Project**

# 3. Methodology

## 3.1 Desktop Review – Bat Conservation Ireland Database

27. Bat Conservation Ireland (BCIreland) acts as the central depository for bat records for the Republic of Ireland. Its bat database comprises more than 100,000 bat records divided into Roost, Transects and Ad Hoc Bat Records. The database primarily contains bat records from the following datasets:
    - Irish Bat Monitoring Programme
    - BATLAS 2020 & 2010
    - Bat Records submitted by ecologists, bat groups etc.

28. Collins (2023) recommends that a minimum Zone of Influence, and therefore a database search, is set at 2km radius of a proposed development site. For larger bat species (which includes the Irish bat species Leisler's bat) the search area can be extended up to 10km. Therefore, the BCIreland database was accessed on 18 February 2025 to collate bat records for a 10km radius of Proposed Project. This was further divided into a 2km buffer radius (minimum search area) and a 5km buffer radius (search radius that includes the Core Sustenance Zones for all Irish bat species as presented in Collins (2023)).

## 3.2 Survey Methodology

29. A number of bat surveys (Table 3-1) were undertaken as part of multidisciplinary walkover surveys or dedicated bat surveys for the Proposed Project and previous iterations of the project[4] between 2016 and 2025. Surveys undertaken for previous iterations of the project remain valid for the Proposed Project as the alignment remains the same in many instances.

**Table 3-1: Bat Surveys and Survey Dates**

| Survey | Survey Type | Survey Date(s) | Surveyor(s) |
|---|---|---|---|
| Protected Mammal Surveys | Bat Surveys – driven transects | June 2016 | TOBIN |
| | Bat Surveys – driven transects | May 2019 | Dr. Tina Aughney (Bat Eco Services) |
| | Bat Surveys – walked transects and static detectors | May to September 2016<br>April to September 2017<br>April to October 2018 | TOBIN |
| | Bat Surveys – walked transects and static detectors | June to September 2019<br>July to September 2020<br>June to August 2021<br>June 2022<br>June to August 2024<br>May and June 2025 | Dr. Tina Aughney (Bat Eco Services) |
| | Bat Surveys – roost emergence/re-entry surveys | July to September 2016<br>April 2017<br>June and July 2018 | TOBIN |
| | Bat Surveys – roost emergence/re-entry surveys | June to September 2019<br>July to September 2020<br>June to August 2021<br>June 2022<br>June to August 2024<br>May and June 2025 | Dr. Tina Aughney (Bat Eco Services) |

[4] 'Previous iterations of the project' refer to the In-flight Water Supply Project developed prior to the adoption of the National Water Resources Plan and Eastern and Midlands Plan. The 'Proposed Project' refers to the project that planning permission is being sought for and that has taken account of the conclusions of the National Water Resources Plan and Eastern and Midlands Plan. The Proposed Project aligns with the Preferred Approach for the Eastern and Midlands Region, a New Shannon Source with transfers as set out in the Eastern and Midlands Plan. Reference is made to previous iterations of the project where design development and survey results are relevant to the Proposed Project.

### 3.2.1 Daytime Inspections

30. The building and trees were inspected during the daytime visually with the aid of a strong torch beam (LED Lenser P14.2) and endoscope (General DC5660A Wet/Dry Scope). The trees were classified using the Bat Tree Habitat Key (BTHK, 2018) and the classification system adapted from Collins (2016). The Potential Roost Features (PRFs) listed in this guide were used to determine the Potential Bat Roost (PBR) value of trees.

### 3.2.2 Night-time Bat Detector Surveys

#### *3.2.2.1 Dusk & Dawn Bat Surveys*

31. Dusk emergence surveys were completed from 10-15 minutes before sunset to at least 110 minutes post sunset. The following equipment was used over the years of bat surveys:
    - Surveyor 1 (Principal surveyor): Anabat Walkabout Full Spectrum Bat Detector
    - Surveyor 2: Bat Logger M2 Spectrum Bat Detector
    - Surveyor 3: Anabat Scout Full Spectrum Bat Detector.
    - Night Vision Aids were also used during dusk and dawn surveys. The equipment deployed included: Guide TrackIR Pro25 thermal imagery scope, a Guide TrackIR Pro19 thermal imagery scope, and Sony Camcorder with night-vision capability coupled with Dedo RedLight.

#### *3.2.2.2 Static Surveillance*

32. Static units (full time bat detector set to recorded 30 minutes before sunset to 30 minutes after sunrise) were deployed inside Building 1 as part of routine passive static bat detector surveys. In 2025, as part of the tree surveys of PBRs, static surveillance was also undertaken directly beside the identified PBRs for a minimum of one night to provide bat activity in vicinity of the tree in order to supplement night surveys undertaken (i.e. dusk surveys). The recordings are analysed using Wildlife Acoustics Kaleidoscope Pro.

# 4. Results

## 4.1 Desktop Review – Bat Conservation Ireland Database

33. A total of 2,001 geo-referenced bat records were available for the 10km search area. The number of records for each of the bat species is listed in Table 4-1 and this includes 87 roosts (some with multiple species recorded) and 1,914 bat detector records (some locations with multiple species recorded). The common pipistrelle was the most frequently recorded bat species followed by soprano pipistrelle.

34. This data was further refined to 5km and 2km and the results are presented in Table 4-1. There are seven roost records within 1km of the Project Boundary at the Time of Review (which are still relevant for the Proposed Project), four of which are maternity colonies for whiskered bats, soprano pipistrelles and Leisler's bats (including two proposed Natural Heritage Areas for this bat species: Site Codes 002058 and 000568), all of which are located in vicinity of Birr, County Offaly, and between 500m to 1km from the Project Boundary at the Time of Review.

**Table 4-1: Bat Records within a 10km, 5km and 2km Search Area of the Project Boundary at the Time of Review (Source: Bat Conservation Ireland (BCIreland) Database)**

| Bat Species | No. of Records | | Bat Species | No. of Records | |
|---|---|---|---|---|---|
| **10km Radius** | **Roost** | **Detector** | | **Roost** | **Detector** |
| Common pipistrelle | 16 | 1204 | Soprano pipistrelle | 23 | 722 |
| Nathusius' pipistrelle | 0 | 35 | Leisler's bat | 23 | 451 |
| Daubenton's bat | 6 | 198 | Whiskered bat | 3 | 18 |
| Brown long-eared bat | 33 | 126 | Natterer's bat | 8 | 38 |
| *Pipistrellus* spp. | 15 | 83 | *Myotis* spp. | 1 | 54 |
| Lesser horseshoe bat | 0 | 0 | - | - | - |
| **Bat Species** | **No. of Records** | | **Bat Species** | **No. of Records** | |
| **5km Radius** | **Roost** | **Detector** | | **Roost** | **Detector** |
| Common pipistrelle | 11 | 526 | Soprano pipistrelle | 11 | 988 |
| Nathusius' pipistrelle | 0 | 7 | Leisler's bat | 16 | 270 |
| Daubenton's bat | 2 | 97 | Whiskered bat | 2 | 11 |
| Brown long-eared bat | 14 | 60 | Natterer's bat | 4 | 19 |
| *Pipistrellus* spp. | 8 | 32 | *Myotis* spp. | 0 | 21 |
| Lesser horseshoe bat | 0 | 0 | - | - | - |
| **Bat Species** | **No. of Records** | | **Bat Species** | **No. of Records** | |
| **2km Radius** | Roost | **Detector** | | **Roost** | **Detector** |
| Common pipistrelle | 4 | 867 | Soprano pipistrelle | 8 | 391 |
| Nathusius' pipistrelle | 0 | 6 | Leisler's bat | 9 | 185 |
| Daubenton's bat | 0 | 45 | Whiskered bat | 1 | 8 |
| Brown long-eared bat | 4 | 42 | Natterer's bat | 0 | 13 |
| *Pipistrellus* spp. | 4 | 12 | *Myotis* spp. | 0 | 12 |
| Lesser horseshoe bat | 0 | 0 | - | - | - |

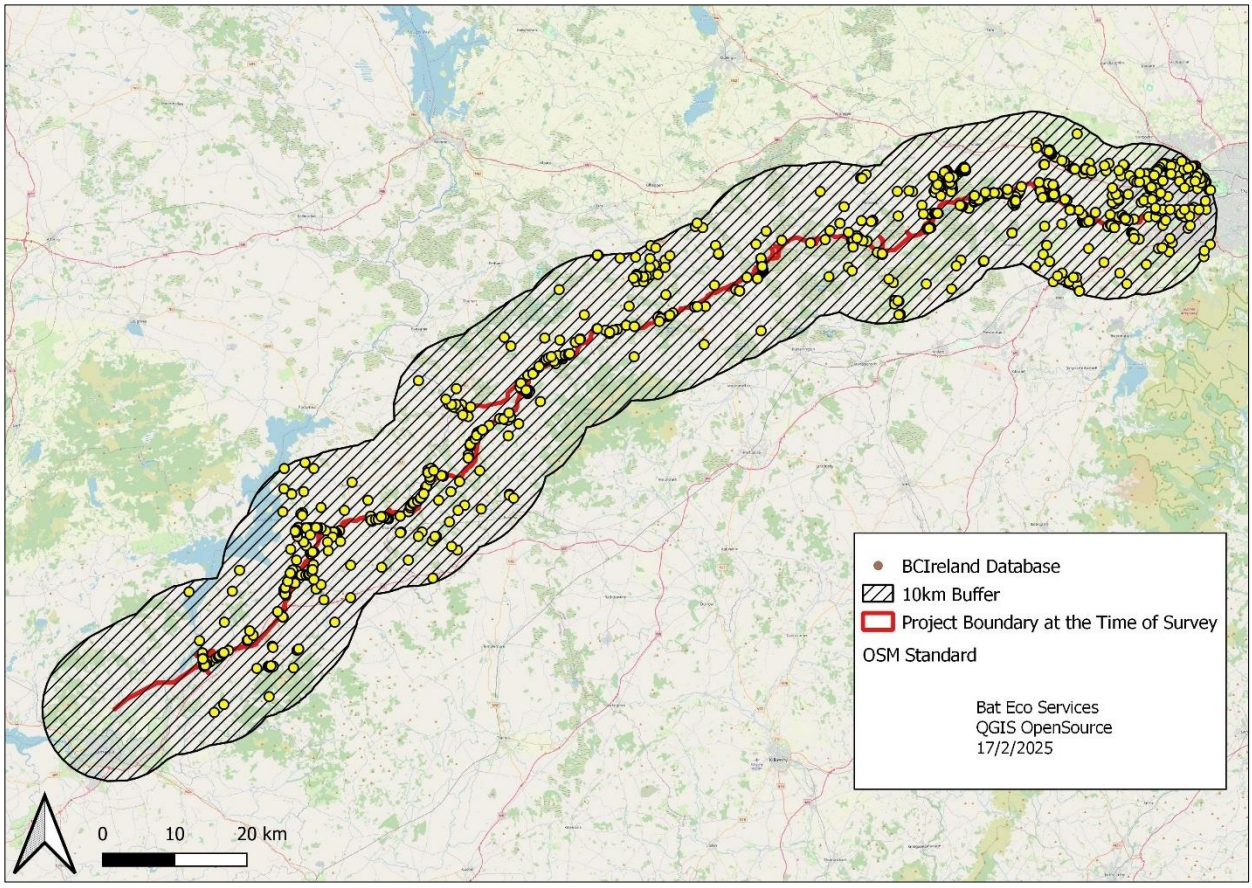


**Figure 4-1: BCIreland Database Bat Records for 10km Buffer of Project Boundary at the Time of Review**

## 4.2 Survey Results

### 4.2.1 Building 1

35. Building 1 is located in an agricultural field surrounded by a well-connected linear habitat landscape. A large number of surveys have been undertaken of this building since 2019. Table 4-2 presents these details.

**Table 4-2: Building 1 – Survey Details**

| Building Code | Description | Daytime Inspections Dates | Night-time Survey Dates |
|---|---|---|---|
| Building 1<br><br>TW 0<br><br>TY32282N<br><br>R72254 70635 | Cottage – single storey, tiled roof, no roof felt, natural stone walls, ivy cover.<br><br>WTP site at Incha Beg | Daytime Inspection (external only) on 19/6/2019, 6/7/2020, 11/8/2020, 24/6/2022, 20/5/2025, 16/6/2025<br><br>Internal structure not accessible.<br><br>High suitability due condition of the structure, ivy growth and location of the structure in a suitable landscape for bats. | Dusk and dawn surveys: 6/7/2020, 11/8/2020, 24/6/2022, 20/5/2025, 16/6/2025<br><br>Static surveillance (static unit placed within the building):<br>2 nights recording – 19th to 21st June 2019<br>4 nights recording – 6th to 10th July 2020<br>4 nights recording – 20th to 24th June 2022<br>5 nights recording – 20th to 25th May 2025<br>4 nights recording – 16th to 20th June 2025 |

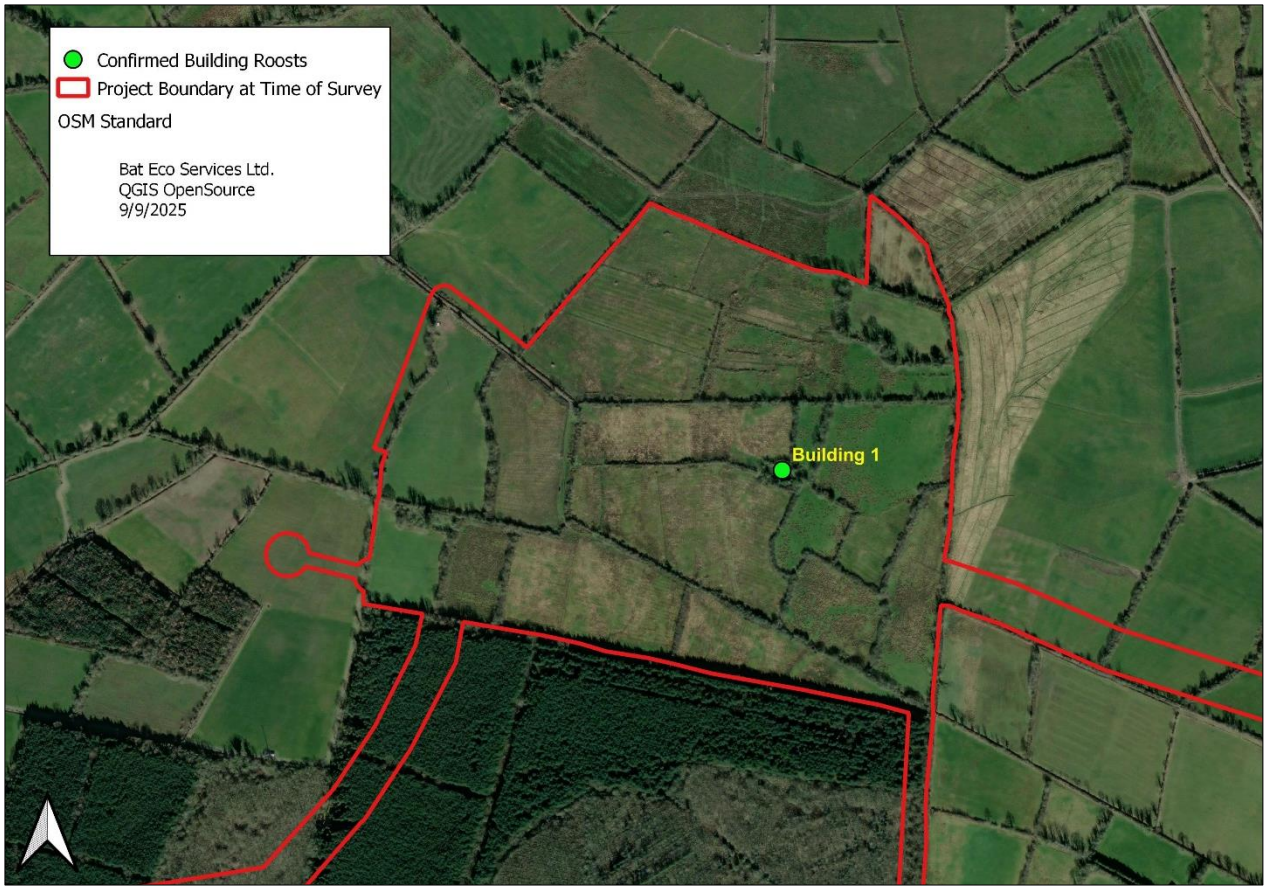


**Figure 4-2: Location of Building 1**

**Plate 4-1 to 4-3: Photographs of Building 1**

36. Table 4-3 presents the summary of the results of the array surveys undertaken. In relation to static surveillance, due to the fact that bat echolocation calls can travel long distances, depending on the bat species, often calls recorded by the static unit can be from individual bats flying outside the structure. Therefore, the calls recorded were examined to determine if calls were produced by a bat flying inside the building or outside the building. This is particularly the case for quiet echolocating bat species such as lesser horseshoe bats, Daubenton's bat, Natterer's bat and *Myotis* species. The dusk surveys and static surveillance recorded Building 1 as a night roost for a lesser horseshoe bat and a day roost for a Natterer's bat and a brown long-eared bat.

**Table 4-3: Building 1 – Survey Results**

Leis = Leisler's bat, CP = common pipistrelle, SP = soprano pipistrelle, MY = Myotis species, LHB = lesser horseshoe bat.

| Building Code | Roost Type & Location | Static Surveillance Results | Dusk Survey Results | Vegetation/Lighting Arrangement |
|---|---|---|---|---|
| Building 1<br><br>TW 0<br><br>TY32282N | Night roost for a lesser horseshoe bat and a day roost for a brown long-eared bat and a Natterer's bat.<br><br>Internal space of building. Exit point through one open window. | June 2019: four bat species recorded: Leis, CP, SP and My.<br><br>July 2020: four bat species: Leis, CP, SP and LHB (one pass at 01:58 hrs on 7/7/2020).<br><br>June 2022: no bats recorded.<br><br>May 2025: 8 brown long-eared bat passes and 3 *Myotis* species bat passes.<br><br>June 2025: 10 brown long-eared bat passes and 1 Natterer's bat pass. | 6/7/2020 (dusk survey) – no bats recorded emerging<br><br>11/8/2020 (dusk survey) – no bats recorded emerging<br><br>24/6/2022 (dawn survey) – no bats recorded returning to building<br><br>20/5/2025 (dusk survey) – no bats recorded emerging<br><br>16/6/2025 – a single brown long-eared bat (22:21 hrs) and a single Natterer's bat (23:11 hrs) were recorded emerging. | Ivy growth on building. Extensive hedgerow network. No lighting. |

### 4.2.2 Tree Roosts

37. Four confirmed tree roosts are located within the Proposed Project (Table 4-4): soprano pipistrelles in Parteen Woodland (Tree C, surveyed by Bat Eco Services in 2020), PBR 8 located in a treeline in an agricultural field north of the M7 (Natterer's bat roost – single bat) and PBR 20 located as a mature tree linear boundary along the R440 east of Daingean, County Offlay (two trees recorded as bat roosts for soprano pipistrelle and common pipistrelle, respectively). All of these trees were confirmed as tree roosts by dusk surveys (coupled with thermal imagery filming).

**Figure 4-3: Location of Tree C, Parteen Woodland, County Tipperary**

**Figure 4-4: Location of PBR 8, County Tipperary**

**Plate 4-4: Photograph of PBR8**

**Figure 4-5: Location of PBR 20, County Offaly**

**Plate 4-5: Photograph of PBR20 Treeline**

### Table 4-4: Tree Survey Results of Confirmed Bat Roosts within the Project Boundary Area

| Tree/PBR Code | Roost Type & Location | Bat Species (No. of Bats) | Access Points | Vegetation/Lighting Arrangement |
|---|---|---|---|---|
| Tree C<br><br>Category 1 PBR<br><br>Dusk survey: 21st September 2020<br>Dusk survey: 20th June 2022<br>Dawn survey: 21st June 2022 | Tree roost<br><br>Single soprano pipistrelle emerged from tree from 21/9/2020 dusk survey. No bats emerged from the tree during 2nd dusk survey and dawn survey.<br><br>R7002670149<br><br>Parteen Wood | Daytime inspection (Phase 1)<br><br>Dusk and dawn surveys: other bat species recorded foraging and commuting in the survey area – Leisler's bats, Daubenton's bat, soprano pipistrelle and common pipistrelles recorded. | Open spilt limb | Tree is located in a woodland adjacent to the River Shannon. No lighting present.<br><br>No roost recorded during the 2022 surveys. |
| PBR 8 (single mature oak tree with heavy ivy growth)<br><br>Category 2 PBR<br><br>Dusk emergence survey (20/5/2025)<br><br>Static surveillance: 2 nights (20/5/2025 to 22/5/2025)<br><br>ITM 576767 671452 | Tree roost<br><br>Single Natterer's bat emerged from broken limb/dead wood.<br><br>Broken limb with dead wood in upper left-hand side of tree – indicated by thermal imagery. | Dusk survey: Single Natterer's bat emerged from broken limb/dead wood at 22:19 hrs. This was confirmed by thermal imagery and static surveillance.<br><br>Static surveillance: Leisler's bats, soprano pipistrelles, common pipistrelles, Daubenton's bats and Natterer's bats. | Broken limb with dead wood in upper left-hand side of tree. | Dense ivy growth on tree with dead wood and broken limbs. Tree is located in a treeline/hedgerow boundary of agricultural fields in a well-connected landscape of linear habitats. No street lighting. |

| Tree/PBR Code | Roost Type & Location | Bat Species (No. of Bats) | Access Points | Vegetation/Lighting Arrangement |
|---|---|---|---|---|
| PBR 20 (two trees within the treeline boundary)<br><br>Mature treeline of oak, beech and sycamore.<br><br>Category 1 & 2 PBRs<br><br>Dusk emergence surveys: 10/6/2025 and 11/6/2025<br><br>Static surveillance: two nights (10/6/2025 to 12/6/2025)<br><br>ITM 652865 728211 | Tree roost<br><br>Common pipistrelles and soprano pipistrelles in two trees in the southern end of the treeline boundary along road. | Dusk survey: two small roosts for common pipistrelles and soprano pipistrelle (<5 individuals) were recorded emerging from beech trees.<br><br>Static surveillance: Leisler's bats, soprano pipistrelles, common pipistrelles, brown long-eared bat and Daubenton's bat. | Tree holes/damaged limbs high in the trees – assisted by thermal imagery. Exact location was not confirmed due to the density of the trees surveyed. | Mature treeline along a local road (>29 trees, ranging from early mature to mature). Extensive PRFs in the majority of the trees. No street lighting. |

# 5. Examination of Impacts and Assessment of Alternatives

## 5.1 Potential Impacts

38. The Proposed Project works would result in the loss of night, day and satellite roosts, the details of which are presented in the Table 5-1.

Table 5-1: Bat Roost Results and the Impact of the Proposed Project

| Bat Species | Roosts | Potential Impact |
|---|---|---|
| **Lesser horseshoe bat, Natterer's bat & brown long-eared bat** | Building 1 – Incha Beg | Loss of night and day roosts |
| **Soprano pipistrelle** | Tree roost C – Parteen Wood | Loss of day roost |
| **Natterer's bat** | Tree roost (PBR 8) | Loss of day roost |
| **Common pipistrelle** | Tree roost (beech tree)<br>(PBR 20 – treeline with 29 trees) | Loss of small satellite roost |
| **Soprano pipistrelle** | Tree roost (beech tree)<br>(PBR 20 – treeline with 29 trees) | Loss of small satellite roost |

39. The Proposed Project works would result in the following potential impacts (Table 5-2):

- It is anticipated that the Construction Phase of the principal elements of the Proposed Project will extend over 24 months. Therefore, the potential impacts are examined in relation to this time frame.
- Roost loss during construction works in relation to the demolition of Building 1 will result in a night roost loss for lesser horseshoe bat and day roost loss for Natterer's bat and brown long-eared bat and this is deemed as **Permanent Slight Negative Effect at a local level.**
- Roost loss of PBRs on all bat species recorded (i.e. Natterer's bat, soprano pipistrelle and common pipistrelle) are assessed a **Permanent Slight Negative Effect at a local level.**

Table 5-2: Bat Roost Results and the Impact of the Proposed Project in More Detail

| Description | Bat Species | Potential Impacts | Level of Effect |
|---|---|---|---|
| **Building 1** | Lesser horseshoe bat, Natterer's bat, brown long-eared bat | Removal of structure and therefore loss of roost. Loss of foraging and commuting habitat. However, in relation to lesser horseshoe bat, this location is outside the principal territory for species of bat. Building is located approx. 2km from County Clare. The immediate landscape leading to the River Shannon to the north of the Proposed Project comprises a good network of linear habitats that will provide foraging and commuting habitat in a rural setting and therefore little outdoor street lighting.<br><br>The removal of the structure will also result in the loss of a daytime roost for Natterer's bat and brown long-eared bat. However, these two species are not Annex II species and their distribution is more widespread. But both species are woodland specialists and therefore depend on linear habitats for commuting and foraging. | Slight Negative Effect |
| **Tree C** | Soprano pipistrelle | Tree felling will result in the loss of this roost. This tree is located within a woodland along the shores of the River Shannon. Small area of woodland is proposed to be felled adjacent to it while extensive linear habitats will remain in the immediate landscape. | Slight Negative Effect |
| **PBR 8** | Natterer's bat | This tree is located in a linear habitat within the Proposed Project. This is a suitable foraging and commuting habitat. A single Natterer's bat was recorded roosting in the tree. There are suitable buildings located directly north and east of the tree connected to suitable foraging area that may provide additional roosting locations for this species of bat. | Slight Negative Effect |

| Description | Bat Species | Potential Impacts | Level of Effect |
|---|---|---|---|
| **PBR 20** | Common pipistrelle & Soprano pipistrelle | This PBR represents a mature treeline along a local road. The majority of the trees have PRFs suitable for roosting bats. Two trees were recorded as roosts for two species of bat (small satellite roosts). However, a number of additional individuals were noted commuting from buildings adjacent to the treeline and therefore the satellite roosts recorded are likely to be supported by building roosts nearby. | Slight Negative Effect |

## 5.2 Proposed Mitigation Measures

40. To reduce the potential negative impact of the Proposed Project on local bat populations, the following mitigation measures will be fully implemented. The Bat Mitigation Guidelines (Marnell *et al.*, 2022) are the principal guidance in relation to bat mitigation in Ireland. The mitigation requirements recommend specific provisions depending on the type of roost and bat species recorded roosting.

41. According to Figure 20 of Marnell *et al.* (2022) the roost in Building 1 (lesser horseshoe bat night-time roost and Natterer's bat/brown long-eared bat daytime roosts) and PBR 8 (Natterer's bat daytime roost) would have a status of '*Small numbers of rarer species. Not a maternity site*'. Conservation significance is deemed at a medium level. This dictates the following is required:

    - Provision of new roost facilities where possible. Need not be exactly like-for-like, but should be suitable, based on species' requirements. Minimal timing constraints or monitoring required.

42. The assessment for proportionate mitigation is less for the soprano pipistrelle bats and common pipistrelles because they are common bat species. Therefore, the provision of an alternative roost for lesser horseshoe bats will be the priority, but with consideration for all other bat species recorded roosting in Building 1 (Natterer's bat and brown long-eared bat) and Tree C (soprano pipistrelle). This will be in the form of a bat house. Bat boxes will be erected as alternative roosts for PBR 8 and PBR 20 (common pipistrelle and soprano pipistrelle roosts).

43. The locations of the building roost (Building 1) and tree roost (Tree C) in question are in Incha Beg and Parteen Woodland, respectively. The bat house will be constructed at a location where the structure will be protected from construction works and where landscaping can be undertaken around the bat house to provide additional linear habitat features to connect the planting to existing linear habitats in the immediate area. A single bat house will be design principally for lesser horseshoe bats but will also consist of bat tubes that will provide alternative roosting for Natterer's bats, brown long-eared bats and soprano pipistrelles.

44. The bat house will be located near the WTP site, along a treeline/hedgerow. This will provide direct access, for roosting bats, to preferred commuting and foraging habitat.

### 5.2.1 Alternative Bat Roost

<u>Step 1</u>

45. An NPWS Derogation Licence is required.

<u>Step 2</u>

46. One bat house (alternative bat roost) is required to be constructed prior to the removal of Building 1 and tree removal of the tree roost (Tree C) recorded in Parteen Wood. This will be constructed at least one year prior to tree felling and building removal.

47. Marnell *et. al. (*2022) and Schofield (2008 & 2025) are used to design alternative bat roosting structures for lesser horseshoe bats with roosting provisions for soprano pipistrelles. Additional communications made with NPWS and Vincent Wildlife Trust (VWT) in relation to newly designed day roost for lesser horseshoe bats (*pers comm* Declan O' Donnell, NPWS and Dr. Kate McAney, VWT) was also taken into consideration in relation to alternative structures. In addition, VWT constructed six lesser horseshoe bat daytime roosts as The Mulkear EIP Project (VWT, 2023). Bat Eco Services undertook the design and supervision of a similar design for County Clare as part of bat mitigation work. The VWT Bat Tower is presented in the 2nd edition of The Lesser Horseshoe Bat Conservation Handbook (Schofield 2025).

48. The alternative roost design will also include roosting for Natterer's bat, brown long-eared bat and soprano pipistrelle. These will be in the form of bat tubes inserted into the external walls of the bat house. Such bat tubes have been successfully used by the soprano pipistrelles, Leisler's bats and Daubenton's bat in mitigation work undertaken by Bat Eco Services Ltd. and is considered suitable for other *Myotis* species and brown long-eared bats. The design of the internal loft space of the bat house is also considered suitable for the three named bat species and such have been recorded in other bat house designed specifically for lesser horseshoe bats (Aughney *et al.,* 2022).

49. Schofield (2025) states the following general recommendations for the construction of bat towers:
    - Single storey buildings or large towers are suitable for roosting lesser horseshoe bat
    - A full damp course is not needed as an earthen floor provides humidity
    - Traditionally built roofs using joists and rafters are ideal (avoid modern pre-formed roof trussers as this increases the number of timbers across the width of the roof space, creating obstacles)
    - A pitched roof creates a thermal gradient and should be constructed from local material such as slate
    - The roof should be lined with bitumen roof felt (avoiding modern breathable roof felt)
    - Internally, a ceiling is required to provide a loft space with a hatch for access between the loft and ground floor for the bats
    - Bat entrances of 500mm by 500mm at the ground floor level is recommended, with sufficient space for the bats to light sample
    - The bat entrance should face north or east and tall vegetation should be planted directly beside the roost entrance to provide cover for emerging bats.

50. The following principles will be followed:
    - Located as close to the existing roosts as possible
    - The location of the alternative roost will be close to existing flight lines and foraging habitat to increase its success
    - The design will take into consideration the requirements of the species concerned
    - The alternative roost will be designed to provide suitable thermal regimes
    - Opportunities will be taken to provide a variety of roosting opportunities and thermal regimes so as to maximise the value of the structure for bats
    - This will be completed in relation to the ecological requirements for soprano pipistrelles.

51. With the above points in mind, the alternative roost plans are presented in Figure 5-1.

52. Components of structure:

- Overall dimensions of the bat house are an internal floor space of 3m x 3m constructed from concrete block, rendered externally with plaster (the internal walls are left un-plastered). The external height of the bat house is 3.8m at the highest point to facilitate 1.8m standing room in both ground floor and loft space. These dimensions are slightly different to the VWT Bat Tower in order to increase the height in the loft space and the overall volume of the structure to make it more suitable for lesser horseshoe bats and does not overheat in potential heat waves (as per recommendation by VWT)
- A-roof (as per architects' recommendations). This A-roof is instead of the sloping roof that the VWT Bat Tower has. (This change to a A-roof is considered better for lesser horseshoe bats.)
- Two bat entrances required, both at 1.7m height to allow access into the ground floor space and the bats fly up into the loft through the open access in the loft floor. One bat entrance is installed on a gable-side with the second on the rear wall (facing the linear habitats of existing boundary). Landscaping will be required adjacent to the entrances to connect to the linear habitats nearby. This will be undertaken in consultation with the landscape team
- The loft floor is constructed to ensure that there is an internal height of 1.8m for both the ground floor and loft floor and allowing 20cm joists/marine ply of the loft floor. Insulation board shall be inserted between the loft floor joists (i.e. underside of loft floor) and lined with a ply wood sheeting above and below joists. Then chicken wire is fixed to the ply wood on the underside of the loft floor (i.e. the ceiling of the ground floor) to provide a grip for lesser horseshoe bats to hang from in the ground floor room
- Natural slate roof only
- 1F bitumous felt (N.B. *No Modern Breathable Felt*)
- Internal loft floor with loft floor opening of 50cm x 50cm (to allow bats to fly from post box entrances into the loft space internally). This loft floor opening is positioned in the centre of the floor. This opening does not have a trap door
- Internal wall – solid concrete block wall not plastered
- External wall – solid concrete block with external walls sand and cement rendered
- Facia and soffit with downpipe
- Four bat tubes to be built into the external wall (tallest section – north-facing wall). Bat tubes are the approximate size of a solid concrete block
- Half (size) steel entrance door with lock
- Bat entrances should be fitted on the north-facing wall and on the east-facing gable wall at 1.7m height (shown on north-facing wall in figure). It is recommended that the VWT predator proof entrance is installed (constructed on demand from a company in Limerick – See Plate 5-1) for this entrance point as it is slightly lower to ground level. This bat entrance has been designed to be predator proof
- Foundation to engineers' specifications.

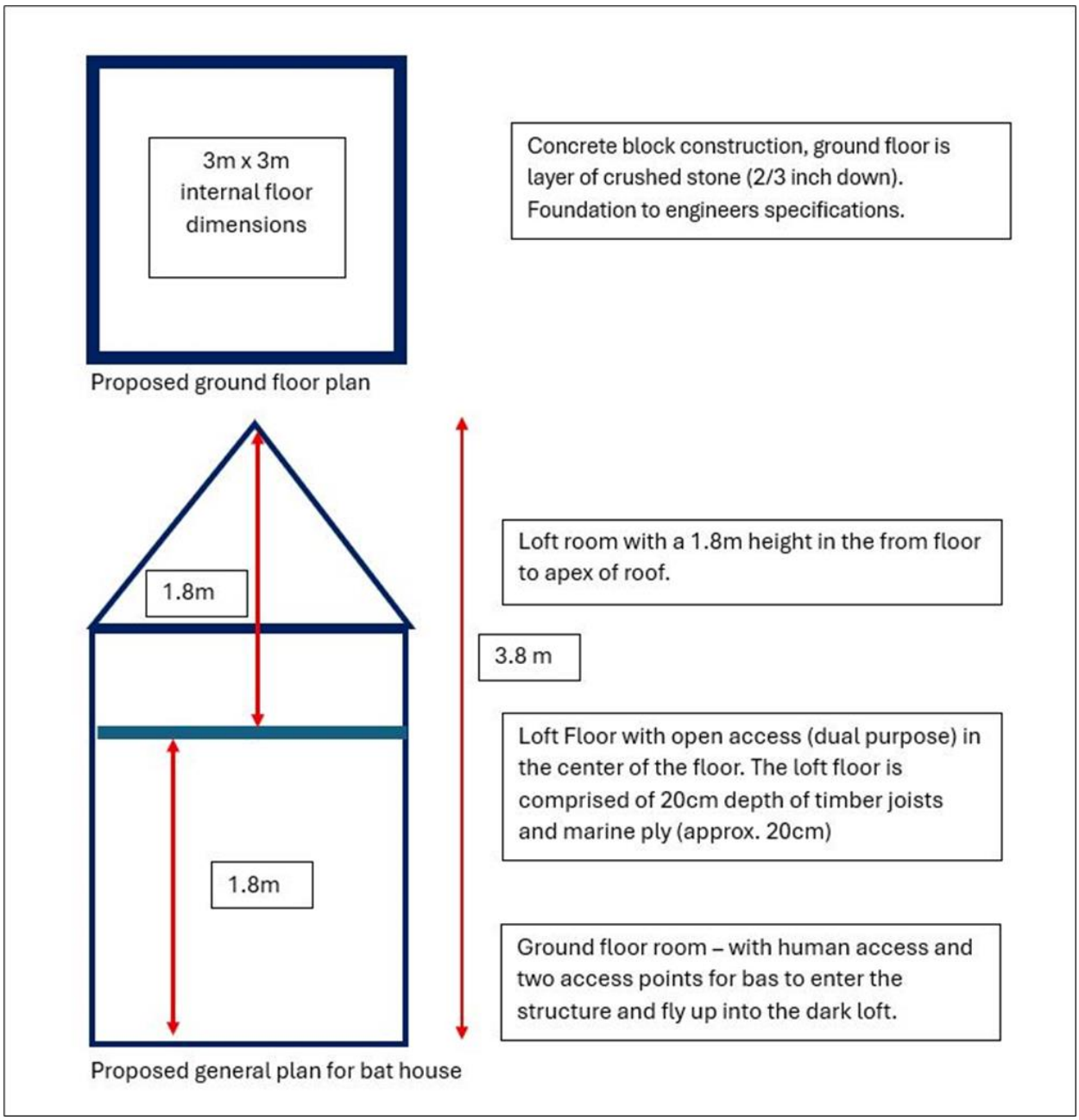


**Figure 5-1: Drawing of Proposed Alternative Bat House**

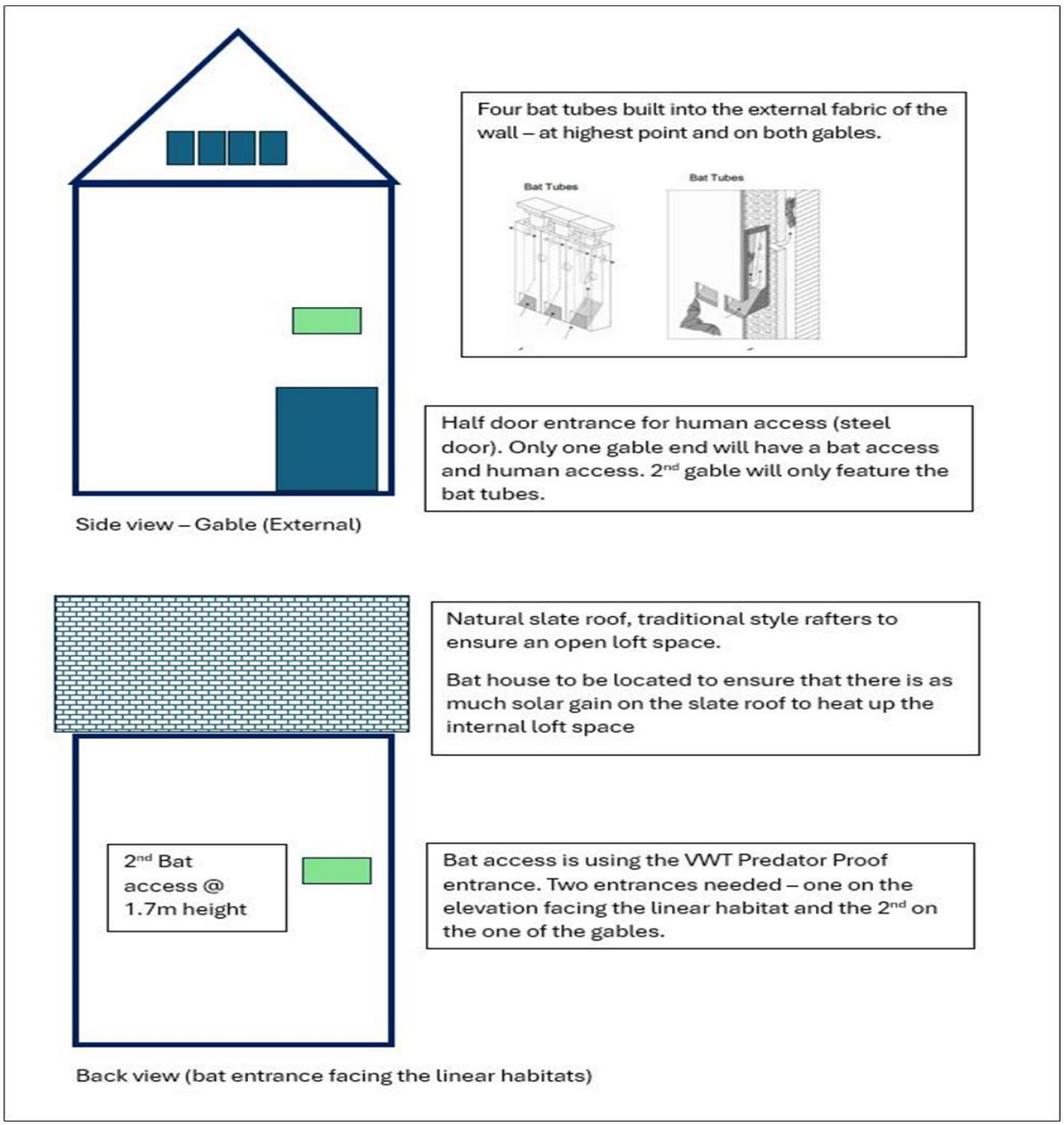


**Figure 5-2: Drawing of Proposed Alternative Bat House**

53. Internally:

- The floor of the building is to be a layer of crushed stone (two or three inches down) (minimum amount of concrete will be used to reduce the negative impact of this material on the thermal conditions of the building) with an upper layer of 804 Clause (crushed) stone
- A partition box will be constructed (marine ply) around the entrance points to reduce light penetrating the loft space. These will be open at the bottom of the box so the bats can enter the box and fly down. Each partition box will be at least 75cm square.

54. Additional roosting:

- Internal walls

55. Hang two units of Integrated Woodstone Bat Box on the wall along the wall plate of ground floor section, as high as possible. The bat specialist will be consulted during this process to ensure that works are completed correctly and that the location of the bat roost is appropriate.

56. It is proposed to locate the bat house in a section of land set aside for biodiversity measures to the north-east of where Building 1 is located (north-east of the WTP). The bat house will be located in the top corner of the field, adjacent to the existing linear habitat, in order to allow new planting to be undertaken around the bat house and link with the existing linear habitats. As this field is sloping towards the topmost corner of the field, the bat house and new planting will be located in a position that wet ground will not cause management issues in the future.

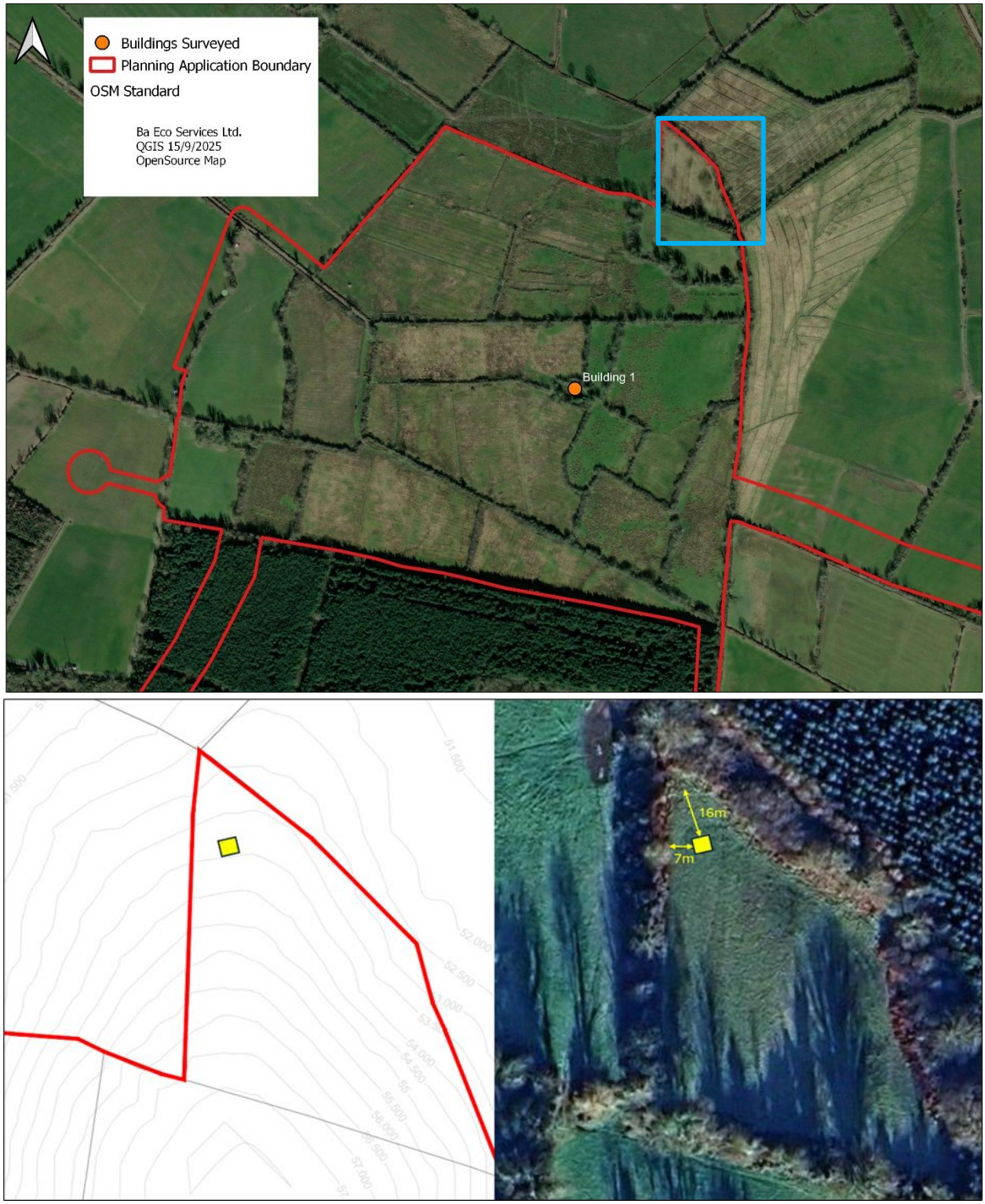


**Figure 5-3: Location of Proposed Alternative Bat House (Yellow Rectangle)**

57. Landscaping components: A native hedgerow will be planted around the boundary of the bat house, 5m from the external wall of the bat house. This will be a double row planted hedgerow of hawthorn and alder whips. Whips of alder will provide a fast-growing hedge that will be approximately 1.5m within 1-2 growing seasons. This will be planted as follows (keep repeating until entire linear boundary is planted):

- 6x 60cm hawthorn whips – planted 45cm apart but in double row, staggered
- 1x alder 90cm whip – planted 60cm from hawthorn whips
- 6x 60cm hawthorn whips – planted 45cm apart but in double row, staggered
- 1x alder 90cm whip – planted 60cm from hawthorn whips
- 6x 60cm hawthorn whips – planted 45cm apart but in double row, staggered.

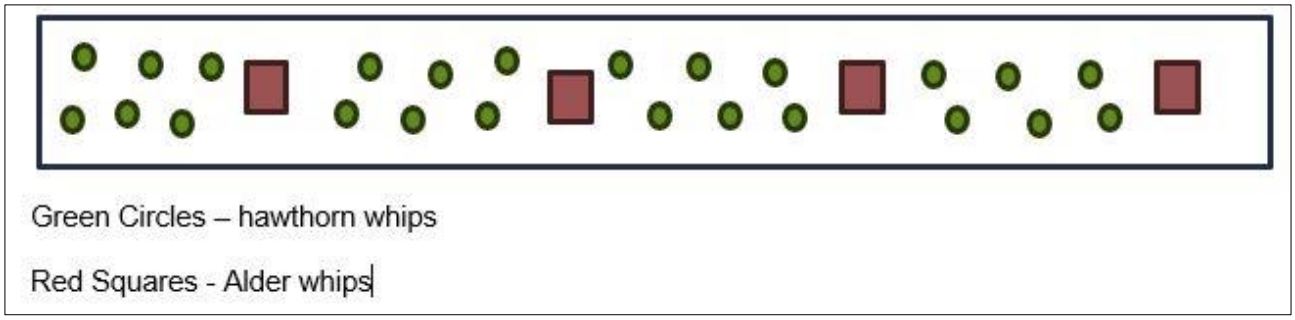


**Figure 5-4: Drawing of Planting for Proposed Alternative Bat House**

58. Landscaping components: The remainder of the field will be planted with trees in a parkland setting (i.e. widely spaced) with a mixture of oak, alder, hazel, holly, birch and mountain ash tree species to provide a native woodland with different height structures.

**Plate 5-1: VWT Lesser Horseshoe Bat Daytime Roost (Photo: VWT, Ireland) with a Close-Up Photograph of the Predator Proof VWT Bat Entrance**

**Plate 5-2: VWT Lesser Horseshoe Bat Daytime Roost (Photo: VWT, Ireland) with a Close-Up Photograph if the Predator Proof VWT Bat Entrance in an Open and Closed Position**

59. The following are some examples of Pine Marten proofing undertaken at other lesser horseshoe roosts.

**Plate 5-3: Garryland Lodge Roost, Garryland Nature Reserve, Gort, County Galway – please note the lead sheet around the windowsill to reduce Pine Marten entering the structure**

**Plate 5-4: Ballykilty Bat House, Couty Clare – please note the lead sheet below the entrance point to reduce Pine Marten entering the structure**

### 5.2.2 Demolition – Building 1

60. A Work Plan is required to ensure that there are no bats present during the demolition works. This will be undertaken in discussion with the contractor and formulated for the NPWS Derogation Licence application. This Work Plan will be also undertaken in consultation with NPWS.

61. It will include the following general guidelines in relation to the demolition of Building 1:

- Static surveillance will be undertaken to determine that no bats are present prior to proposed works
- The removal of the roof will be undertaken in stages under supervision by the bat specialist
- Any crevices or suitable roosting sites within the walls of the stables will be checked by a bat specialist using a torch and endoscope
- Ivy on the external walls of the courtyard will be removed in the autumn months and left on the ground for 24 hours to allow any residing bats to exit safely
- Once the structure is deemed bat free and no longer suitable as a bat roosting site, renovations works may proceed
- This can only be undertaken if the NPWS Derogation Licence has been received.

### 5.2.3 Bat Box Scheme – Alternative Roosting for Tree Roosts

62. The total number of bat boxes required to mitigate for general conservation of local bat populations:

- 50 summer bat boxes (Schwegler Woodcrete 1FF, 2F (with or without timber compartment), 2FN bat boxes – source www.veldshop.nl) to be erected. These are to mitigate for PBRs proposed to be felled as well as general bat conservation measures. The location of these will be within Core Sustenance Zones where suitable mature trees are available to erect bat boxes on. Bat boxes will be erected six months prior to any tree felling. The locations of the bat boxes will be spread out across to the Proposed Project while bat boxes will be required in vicinity of the location of PBR 8 (two bat boxes, where possible) and PBR 20 (four bat boxes, where possible)

63. Bat boxes will be sited carefully and will be undertaken by a bat specialist. Bat boxes will be erected prior to construction works. The bat specialist will erect the bat boxes with assistance from the contractor. Some general points that will be followed include:

- Straight limb trees (or telegraph pole) with no crowding branches or other obstructions for at least 1m above and below the position of the bat box
- Diameter of tree will be wide and strong enough to hold the required number of boxes
- Locate bat boxes in areas where bats are known to forage or adjacent to suitable foraging areas (i.e. Core Sustenance Zones). Locations will be sheltered from prevailing winds
- Bat boxes will be erected at a height of 4m to 5m to reduce the potential of vandalism and predation of resident bats
- Locations for bat boxes will be selected to ensure that the lighting plan for the proposed site does not impact on the bat boxes. Therefore, the bat boxes are to be erected on mature trees located in the field adjacent to the proposed bat roost
- If there is a paucity of suitable mature trees, then telegraph poles, erected purposely for bat boxes will be required. Such telegraph poles will be a minimum of 6m high to allow for 1m of the pole being buried in the ground and bat boxes erected at 4m level off the ground (i.e. the bottom of the box is 4m off the ground)

### 5.2.4 Trees

64. In relation to PBR 8 and PBR 20, the three trees recorded as bat roosts will require a derogation licence to be in place prior to felling as well as the erection of bat boxes. The trees will be resurveyed (dusk survey coupled with night-vision aids) to determine if bats are present at the time of felling. Trees proposed to be removed will be felled on mild days during the autumn months of September, October or November or

spring months of February and March (felling during the spring or autumn months avoids the periods when the bats are most active). Trees with roosting features (dead wood, tree holes etc.) will be checked prior to felling. They will be physically checked (using an endoscope and high-power torch) or a dusk/dawn survey completed to determine if bats are roosting within. A tree felling plan will be required in consultation with the tree contractors.

65. In relation to trees proposed to be felled and identified as PBRs, these will be resurveyed in consultation with the tree contractors. The following applies:
    i) Erection of alternative roosting sites (i.e. bat boxes) is required prior to the removal of trees. These will be erected six months prior to tree felling to allow local bat populations to become aware of them prior to removal of the trees. Depending on the bat species present or the importance of the PBR value of the tree, a minimum of one bat box per tree with up to three bat boxes per tree is required. Bat boxes will be erected, on suitable mature trees, within the Core Sustenance Zone radius of the bat species found to be using the tree or the bat species known to be active in the area of the PBR tree proposed to be felled. A bat box scheme of 50 bat boxes has been proposed in Section 5.2.3 and the locations of these bat boxes will represent the Proposed Project. However, if the trees proposed to be felled are located outside the Core Sustenance Zone with bat boxes, then additional bat boxes will be required.
    ii) Trees identified as a PBRs and proposed to be felled will be re-surveyed. This will be undertaken at least one month prior to tree felling in order to propose a tree felling plan in conjunction with tree contractors. Surveying will entail a daytime ground assessment of the tree, endoscope (plus high-powered torch) examination of roosting features, dusk surveys (coupled with Night Vison Aids) to determine what species are active in the immediate vicinity of the tree and to document if bats are roosting within.
    iii) Trees proposed to be removed will be felled on mild days during the autumn months of September, October or November or spring months of February and March (felling during the spring or autumn months avoids the periods when the bats are most active).
    iv) An assessment of trees according to their PBR value determines the methodology of felling. Trees with PBR Category 1 are highly suitable for roosting bats and require more intensive procedures prior to felling. The trees identified within the study area are PBR Category 1, 2, and 3. The procedure to fell these is as follows:
        (a) Category 1: Trees with roosting features (dead wood, tree holes, etc.) will be checked prior to felling. They will be physically checked (using an endoscope and high-power torch) or a dusk/dawn survey completed to determine if bats are roosting within. A tree felling plan will be required in consultation with the tree surgeons. A bat box scheme will be erected prior to felling and in consultation with the bat specialist. Any trees showing crevices, hollows, etc., will be removed while a bat specialist is present to deal with any bats found. Such animals will be retained in a box until dusk and released on-site. Large mature trees will be felled carefully, essentially by gradual dismantling by tree surgeons, under supervision of a bat specialist. Care will be taken when removing branches as removal of loads may cause cracks or crevices to close, crushing any animals within.
        (b) Category 2: Any ivy-covered trees which require felling will be left to lie for 24 hours after cutting to allow any bats beneath the cover to escape.
        (c) Category 3: Any ivy-covered trees which require felling will be left to lie for 24 hours after cutting to allow any bats beneath the cover to escape.

### 5.2.5 Monitoring

66. Monitoring will be undertaken post-construction works. This monitoring will involve the following aspects:

- Monitoring of bat house within one year of construction and for a minimum of three years post construction. Register bat house with BCIreland
- Inspection of bat boxes within one year of erection of bat box scheme. Register bat box scheme with BCIreland. This will be undertaken for a minimum of two years

- A full summer bat survey will be undertaken post-works, over a period of five years, to monitor any other bat mitigation measures.

## 5.3 Assessment of Alternatives

67. The Eastern and Midlands Plan applied the methodologies set out in the Framework Plan to identify the water supply needs of the Eastern and Midlands region and develop the preferred approaches to resolve them. The key outcome of the Framework Plan and the Eastern and Midlands Plan of relevance to the Proposed Project is that it determined that a New Shannon Source with transfers, comprising an abstraction from Parteen Basin and a transfer of treated water to a termination point reservoir in Dublin, was the Preferred Approach to address the supply demand balance deficit for direct supply to the GDA WRZ.

68. As explained in Section 1.1, the Proposed Project aligns with, and is a significant step towards delivering, the Preferred Approach set out in the Eastern and Midlands Plan for a New Shannon Source with transfers.

69. Therefore, the consideration of reasonable alternatives in respect of the Proposed Project, as addressed in Section 5.3.1, did not re-consider strategic alternatives that had been considered by the NWRP and was carried out within the defined Proposed Project objectives. Therefore, the reasonable alternatives in respect of the Proposed Project which have been considered include, for example, alternatives in terms of project design, technology, location, size and scale.

### 5.3.1 Proposed Project Alternatives

70. The bat roosts that have been identified within the Proposed Project which are subject to loss would be impacted by the RWI&PS, WTP, and Treated Water Pipeline, therefore this section focuses on reasonable alternatives in relation to the alignment of the pipeline and siting of the RWI&PS and WTP.

#### *5.3.1.1 Treated Water Pipeline*

71. The alignment of the pipeline has been progressively refined throughout the development of the Proposed Project and previous iterations of the project[5].

72. From the outset the methodology was based on constraint mapping, a process that relied on consideration of predetermined ‘constraints’ that directly influenced the Pipeline Corridor. Constraints were mapped through both desktop assessment and field surveys. Environmental constraints included, for example, environmental or geological designations or protected habitats, settlements, material assets such as quarries, archaeological features, residential properties, zoned land, protected structures, protected views and floodplains.

73. This methodology enabled the production of a series of Preliminary Route Corridor options. From these a Least Constrained Pipeline Corridor was developed. The Preliminary Route Corridor options were developed to broadly meet many environmental and technical objectives, which included ground conditions, obstructions, accessibility, idealistic elevation and landowner impact. Multi-criteria analysis (MCA) techniques were applied to each of these Preliminary Route Corridor options by technical and environmental specialists to select the Least Constrained Pipeline Corridor.

[5] ‘Previous iterations of the project’ refer to the In-flight Water Supply Project developed prior to the adoption of the National Water Resources Plan and Eastern and Midlands Plan. The ‘Proposed Project’ refers to the project that planning permission is being sought for and that has taken account of the conclusions of the National Water Resources Plan and Eastern and Midlands Plan. The Proposed Project aligns with the Preferred Approach for the Eastern and Midlands Region, a New Shannon Source with transfers as set out in the Eastern and Midlands Plan. Reference is made to previous iterations of the project where design development and survey results are relevant to the Proposed Project.

74. The Least Constrained Pipeline Corridor was further refined to identify an Indicative 50m Pipeline Corridor, within which it would be feasible to construct the pipeline taking account of known environmental and technical constraints at the time. This refinement considered updates to constraint mapping, feedback from non-statutory consultation, surveys, geotechnical investigation, design development and extensive landowner engagement.

75. The final selection of the preferred 50m Pipeline Corridor was an iterative one and involved extensive consultation with landowners directly and indirectly affected, including re-route requests from affected landowners. All adjustments to the Pipeline Corridor were subject to a robust evaluation using MCA techniques. In addition, the process of decision-making made by the design team took account of the potential impact on neighbouring land holdings, i.e. adjacent lands could not be unduly disadvantaged by reaching agreement elsewhere. The decision-making process for this step comprised three evaluation categories:

- Technical
- Environmental
- Landowner issues.

76. Technical considerations assessed the design and constructability of proposed changes, and included:

- Adequate working area to construct the pipeline
- Proximity to buildings and infrastructure
- Impact of any correction to the pipeline length, and the number of fittings required, which may have affected its hydraulic operation
- The 'shape' of the landholding, consideration of severance of agricultural land, and relative alignment of the pipeline
- Topography (which exerts a strong influence on the design of any pipeline project), as it will determine the horizontal/vertical alignment, the flow characteristics through the transported medium, and whether the pipeline is gravity fed or needs a pumping station(s). The topography was utilised to optimise the pipeline design to minimise the diameter of the pipeline and pumping costs, limit the impact on the environment and mitigate energy consumption
- Watercourse crossings which introduce greater complexity in construction.

77. The environmental evaluation of proposed changes included:

- Ecology – impact on flora and fauna, particularly with respect to Annex I and Annex II of the Habitats Directive
- Traffic – the maintenance of access to property and safe sight lines
- Cultural heritage – proximity to architectural, cultural and archaeological heritage assets
- Impact on watercourses
- Watercourse crossing alignments (optimal design would dictate that the pipeline crossing would be perpendicular to the watercourse)
- Community, people, land uses including agriculture and economic enterprises.

78. With respect to the landowner category, the following factors were considered:

- Whether agreement was required from neighbouring landowner(s) to facilitate a proposed realignment of the pipeline
- The level of additional impact on neighbouring landowner(s) whose land already fell within curtilage of the Pipeline Corridor
- Whether suggested changes may affect landowners whose land was not previously directly impacted by the proposals.

79. The routing decision was subsequently refined in consultation with affected landowners and with regard to the technical parameters of the pipeline such as its ancillary infrastructure (for example, Line Valves), and crossing points (watercourses, roads, existing utility assets). The final preferred Pipeline Corridor was developed through:

- Considering feedback from public consultation on the Preferred 200m Pipeline Corridor
- Consultation with private and public landowners
- Consideration of reroute requests from landowners
- Assessing information from the environmental surveys
- Finalisation of the hydraulic design.

80. As a result of the iterative refinement to the pipeline alignment, the Treated Water Pipeline route which is contained within the planning application was determined. Uisce Éireann chose a route for the pipeline that avoids environmentally sensitive areas, as far as reasonably practicable, to minimise environmental impacts, while considering technical and cost factors. There are therefore no reasonable alternative options that would have a lower impact.

*5.3.1.2 Raw Water Intake and Pumping Station*

81. Five broad locations along Lough Derg and Parteen Basin were considered that met the environmental and technical objectives and as such provided reasonable options in principle: Slevoir, Mota, Dromineer, Youghal and Parteen. These sites were compared using MCA and the Parteen Basin location was considered to be the least constrained of the abstraction options for the following reasons:

- Modelling studies of the Lough Derg abstraction locations showed a measurable impact on flushing time in the lake and this would be likely to have a negative impact on the conservation objectives of Lough Derg Special Area of Conservation (SAC) and of the entire lake aquatic ecosystem. By comparison, the level of impact predicted at Parteen Basin was considered too low to affect its ecological status
- Parteen Basin is a reservoir formed by the creation of Ardnacrusha dam, hence it is not as sensitive a lake habitat as Lough Derg, with low fisheries value, less developed wetlands habitat and with more areas of more modified (non-qualifying habitat) occurring on the eastern shore
- The limited relative impact on flushing times (generated at the time of the assessment) in Parteen Basin supports the consideration of a lower potential impact on the objectives of the Water Framework Directive relative to abstraction from Lough Derg
- Due to the location of the Parteen Basin it was considered more likely of finding a suitable site for the location of the necessary infrastructure which would mitigate the impact on known planning, cultural heritage, and landscape and visual constraints.

82. Based on the preferred abstraction location at Parteen Basin, three potential areas for the RWI&PS in the vicinity of the Parteen Basin were identified. These areas were:

- RWA-W located on the western shore of Parteen Basin and within the Lower River Shannon SAC
- RWA-E located on the eastern shore of Parteen Basin and within the Lower River Shannon SAC
- RAW-N located on the eastern bank of the River Shannon (immediately downstream of Lough Derg) and not part of any European site.

83. Although RAW-N is not within a European site, the area was discounted from further consideration due to its proximity to the existing urban area of Ballina and the steep terrain of the area. Furthermore, a pipe route transfer would only be feasible if existing properties were acquired and demolished to accommodate construction.

84. MCA was undertaken for the remaining areas (RWA-W and RWA-E) which identified four sub-options, two on the western shore of Parteen Basin (RWA Site 1W and RWA Site 2W) and a further two sites on the eastern shore (RWA Site 3E and RWA Site 4E). MCA was undertaken on the sub-options which determined RWA Site 3E as the preferred location of a raw water abstraction for the following reasons:

- RWA Sites 1W and 2W would require additional pipeline construction through Parteen Basin which would have a higher potential for ecological, archaeological and technical risks. Furthermore, Construction Phase haul routes to the M7 Dublin-Limerick Road would be required to route through residential, commercial and industrial areas in Limerick City
- RWA Site 4E would be located within a woodland of higher value than RWA Site 3E
- RWA Site 3E would be well screened, south of the Fort Henry demesne lands and provides no obstruction to views of Parteen Basin from the western bank.

85. As a result of the consideration of alternative sites, the location of the RWI&PS which is contained within the planning application was determined. Uisce Éireann chose a site for the RWI&PS that avoids environmentally sensitive areas, as far as reasonably practicable, to minimise environmental impacts, while considering technical and cost factors. There are therefore no reasonable alternative options that would have a lower impact.

*5.3.1.3 Water Treatment Plant*

86. Potential locations for the WTP were identified that were sufficiently large to accommodate the development within approximately 3km of the proposed RWI&PS. This was achieved by excluding sites with significant environmental constraints, such as areas of higher biodiversity potential, existing residential development and areas of archaeological interest.

87. The 3km search radius from the RWI&PS was adopted to limit the length of RWRMs, as longer raw water pipelines would pose a higher invasive non-native species risk during the Operational Phase and would increase general maintenance requirements. The further the WTP is from the RWI&PS, the longer the length of twin pipeline that would be required which would increase cost and pumping. A shorter length of pipeline would reduce the energy requirement from the operation of the Proposed Project and, as a result, help to optimise the energy efficiency and reduce carbon emissions.

88. Three general areas were identified that met the broad environmental and technical objectives and as such provided reasonable options in principle:

- Area A was 1.5km to 2.5km north-east of the RWI&PS and the R494 road. Area A was identified as the least constrained area for siting a WTP as it was largely composed of open farmland, with no direct impact on properties or priority habitats
- Area B was south of the RWI&PS. It extended north of the Kilmastulla River and was bounded along the west by Parteen Basin and to the south-east by the R466 road between Birdhill and O'Briensbridge. Area B was environmentally constrained by the Lower Shannon SAC, including the Kilmastulla River. The area was also within the floodplain of the Kilmastulla River
- Area C incorporated considerable existing development, including residential properties.

89. Overall, Area A was identified as the preferred general location for the WTP. Once Site Area A had been determined to be the preferred area, four potential land parcels were identified for the WTP and compared using MCA:

- WTP Site 1 was located in the townland of Incha Beg, contained within a sparsely populated rural area that is enclosed within a broad triangle formed by the R496, R445 and R494 regional roads. It was located immediately north of dense woodland but consisted of open fields. The boundary was defined by existing field boundaries and the site was relatively square in shape and with the ground level falling west to east. This provided a desirable hydraulic profile for the treatment process units

- WTP Site 2 was located to the north of WTP Site 1 (and overlapped WTP Site 1 in part) and east of WTP Site 3. The site was contained within a sparsely populated rural area that is enclosed within a broad triangle formed by the R496, R445 and R494 regional roads. The boundary of the site was defined by existing field boundaries and the site was relatively square in shape and with the ground level falling west to east. This provided a desirable hydraulic profile for the treatment process units
- WTP Site 3 was located to the west of WTP Site 1 and WTP Site 2 and was contained within a sparsely populated rural area that was enclosed within a broad triangle formed by the R496, R445 and R494 regional roads. The boundary of the site was defined by existing field boundaries and was relatively square in shape
- WTP Site 4 was located immediately south of WTP Site 1, within an overgrown forested area. The boundary of the site was defined by existing field boundaries and the site was relatively square in shape with the ground level falling west to east. This provided a desirable hydraulic profile for the treatment process units.

90. WTP Site 1 was the preferred location for the WTP. WTP Site 1 benefitted from more favourable potential traffic connections to the R445 and therefore avoided effects that could have arisen from use of smaller local roads. No surface water constraints were identified within WTP Site 1. It was the preferred location from an air quality perspective as it is at a greater distance than the other three sites from nearby sensitive receptors. It was most preferred from a noise/vibration point of view as it was at the greatest distance from nearby residential receptors. It avails of considerable terrain, forestry and hedgerow screening and would not be readily visible from surrounding roads, dwellings and settlements. It was deemed to be the least constrained site because of the land quality and intensity of use and was determined as the site of preference according to population and tourism aspects. This site was furthermost from neighbouring residential receptors and could be accessed easily by construction and operational traffic using the most direct access from the R445.

91. WTP Sites 2 and 3 were more constrained than WTP Site 1 by residential and commercial receptors, and through proximity to the Roolagh watercourse which was categorised as 'moderate status' in the environmental appraisal. WTP Site 4 shared the same access road off the old N7 as that proposed for WTP Site 1 and consequently shared the associated advantages relating to traffic, noting that this would require access via a bridge over the Kilmastulla River. WTP Site 4 would impact on a greater number of sensitive receptors than the other sites, having a greater number of residences within 500m of the site boundaries.

92. As a result of the consideration of alternative sites, the location of the WTP which is contained within the planning application was determined. Uisce Éireann chose a site for the WTP that avoids environmentally sensitive areas, as far as reasonably practicable, to minimise environmental impacts, while considering technical and cost factors. There are therefore no reasonable alternative options that would have a lower impact.

### 5.3.2 Do-Nothing Scenario

93. The 'Do-Nothing' scenario describes the circumstance where no development occurs. In the case where the Proposed Project is not built, there would continue to be changes in biodiversity or ecological value as a result of ongoing land management. The majority of lands within the footprint of the Proposed Project would continue to be managed intensively for agriculture (pastoral and arable farming). Possible changes in management could include further land drainage, scrub clearance and afforestation, and development including commercial, industrial or residential dwellings, the majority of which would have a localised negative effect on ecological value/biodiversity of the area. With the exception of development overlapping with the footprint of the Proposed Project, it is not expected that these changes in land use would be influenced by whether the Proposed Project proceeds or not.

# 6. Conditions for Derogation Licence

94. One building, proposed to be demolished, was recorded as a bat roost (daytime and night-time roosts for lesser horseshoe bat, Natterer's bat and brown long-eared bat). In addition, four tree roosts, recorded as bat roosts, are proposed to be felled for soprano pipistrelle (day roost and satellite roost), common pipistrelle (satellite roost) and Natterer's bat (day roost).

95. In order for the Proposed Project to go ahead, a derogation licence must be sought. Article 16 of the Habitats Directive sets out three conditions, all of which must be met before a derogation from the requirements of Article 12 or Article 13 of the Directive can be granted. These conditions are also set out in Regulation 54 of the Habitats Regulations. The conditions are:

- A reason(s) listed in Regulation 54(2)(a)-(e) applies
- No satisfactory alternatives exist
- Derogation would not be detrimental to the maintenance of a population(s) at a favourable conservation status.

96. The Proposed Project has been assessed under these three conditions.

## 6.1 Test 1 – Reason(s) for Seeking Derogation

97. Regulation 54(2)(a) to (e) states that a derogation licence may be granted for any of the following reasons:

(a) In the interests of protecting wild flora and fauna and conserving natural habitats

(b) To prevent serious damage, in particular to crops, livestock, forests, fisheries and water and other types of property

(c) In the interests of public health and public safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment

(d) For the purpose of research and education, of re-populating and re-introducing these species and for the breeding operations necessary for these purposes, including artificial propagation of plants

(e) To allow, under strictly supervised conditions, on a selective basis and to a limited extent, the taking or keeping of certain specimens of the species to the extent specified therein, which are referred to in the First Schedule.

98. The Proposed Project falls under reason (c) '*In the interests of public health and public safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment*'.

99. The reasoning for reason (c) is set out in Section 1.1. Once completed, the Proposed Project infrastructure would provide the capacity to meet the needs of 36 WRZs across the Eastern and Midlands Region. This aligns with the Eastern and Midlands Plan. It would do this by securing a new source of drinking water from the River Shannon at Parteen Basin. This would provide the capacity to supply up to 300Mld to the GDA WRZ and the Proposed Project's wider Water Supply Area. Overall, this volume of water would:

- Immediately meet the identified need for water within the GDA WRZ to 2050 and beyond
- Enable the future supply to 17 other WRZs by re-directing supplies within the GDA WRZ and expanding the GDA WRZ by incorporating these WRZs into the GDA Regional WRZ, when future projects are brought forward by Uisce Éireann
- Enable the future supply to a further 18 WRZs across the Midlands from Potential Future Connection Points along the pipeline and facilitate the consolidation of those WRZs into four new WRZs, when future projects are brought forward by Uisce Éireann
- Make provision for potential reductions in existing supply volumes due to sustainability requirements anticipated under the new abstraction licensing regime.

## 6.2 Test 2 – There is No Satisfactory Alternative

100. For a derogation licence to be granted, there must be no satisfactory alternatives. As described in Section 5.3, alternative options were considered as part of the design development of the Proposed Project. However, no reasonable options would have a lower impact. Therefore, the proposed measure is the only viable option to ensure the success of the Proposed Project.

## 6.3 Test 3 – Favourable Conservation Status

101. This test assesses whether the derogation licence would be detrimental to the maintenance of the populations of bats at a favourable conservation status in their natural range (Regulation 54(2)). Annex IV species (i.e. all Irish bat in this instance) must be maintained at favourable conservation status or restored to favourable status if this is not the case at present. Each bat species is addressed individually as part of this section.

### 6.3.1 Lesser Horseshoe Bats

102. The lesser horseshoe bat night roost recorded in Building 1 is located in County Tipperary, which is not one of the core counties within which this species of bat is distributed. Therefore, the location is not associated with a particular SAC. The conservation objective for lesser horseshoe bat for an SAC, designated for this species of bat, is to maintain the favourable conservation status, with the attributes and targets outlined in Table 6-1. The nearest SAC to the location of Building 1 is the Lower Shannon SAC (Site Code 002165), 1.8km to the west of Building 1. However, the lesser horseshoe bat is not listed as a qualifying interest for this SAC. The nearest SAC with this bat species listed as a qualifying interest is in the neighbouring county, County Clare, located 18km to the west of the building (Danes Hole, Poulnalecka SAC, Site Code 000030).

103. The lesser horseshoe bat has a preference for broadleaf and mixed woodlands for foraging but requires a mosaic of linear habitat features to commute along (McAney, 2006). Boughey *et al.* (2011) documented that lesser horseshoe bat roosts tend to be located within 440m of broadleaved woodland. Bontadina *et al.* (2002) recorded that lesser horseshoe bats foraging ranges are between 12 and 53ha of preferred habitat types. This study followed radio-tracked female bats and found that they spent 50% of their time foraging within 600m of the maternity roost. However, it was noted by Bontadina *et al.* (2002) that non-lactating females could forage at a much greater distance. Downs *et al.* (2016) documented that the maximum distance travelled by radio-tracked lesser horseshoe bats between June and October was 4.6km with an average distance of 2.2km. This was supported by radio-tracking studies undertaken for the proposed ring-road for Galway City. Radio-tracked individuals in the spring season of 2015 foraged up to 3.56km from the principal roost with an average travelled distance by tracked individuals of 2.86km reported (Rush & Billington, 2015). During the previous autumn season, the maximum commuting distance in September recorded was 4.4km in a single night from the maternity roost (Rush & Billington, 2015). As the reported travelled distances do not exceed 5km, it is therefore deemed that Danes Hole, Poulnalecka SAC is located too far from Proposed Project site to be connected and that individual lesser horseshoe bats recorded commuting within the survey area are not from this roost. Therefore, the Proposed Project will not have an impact on the conservation status of this roost.

**Table 6-1: General Conservation Objectives for Lesser Horseshoe Bats in an SAC**

| Attribute | Measure | Target | Potential for Effect |
|---|---|---|---|
| Population per roost | Number | Minimum number of 100 bats in summer roost and 50 bats in winter roost | No potential impact on nearest SAC with lesser horseshoe bat listed as a qualifying interest |
| Summer roosts | Condition | No decline | No potential impact on nearest SAC with lesser horseshoe bat listed as a qualifying interest |
| Winter roosts | Condition | No decline | No potential impact on nearest SAC with lesser horseshoe bat listed as a qualifying interest |

| Attribute | Measure | Target | Potential for Effect |
|---|---|---|---|
| Number of auxiliary roosts | Number and condition | No decline | No potential impact on nearest SAC with lesser horseshoe bat listed as a qualifying interest |
| Linear features | Kilometres | No significant loss within 2.5km of qualifying roosts | No potential impact on nearest SAC with lesser horseshoe bat listed as a qualifying interest |
| Light pollution | Lux | No significant increase in artificial light intensity adjacent to named roost or along commuting routes within 2.5km of the roost. | No potential impact on nearest SAC with lesser horseshoe bat listed as a qualifying interest |

104. The single lesser horseshoe bat recorded in Building 1 is likely to be linked to the local population in the Killaloe area of County Clare. As a result of surveys completed for the Killaloe By-pass, lesser horseshoe bats were recorded in the area, and during the construction of Clarisford Park Bat House, provision was designed for lesser horseshoe bats (occupancy has been recorded during monitoring of bat house (pers. comm. K. Banks)). In addition, a single bat (male) was also recorded in Ballina, County Tipperary in 2015 (pers. comm. Dr Áine Lynch, NPWS).

105. The modelled Core Area for lesser horseshoe bats is a small area confined to the western seaboard counties of Mayo, Galway, Clare, Limerick, Kerry and Cork (5,993km$^2$). It is considered that this small Core Area represents the only suitable range for this species in the country. The BCIreland Irish Landscape Model indicated that the lesser horseshoe bat habitat preference is for deciduous woodland and riparian vegetation within a few kilometres of roosts and it relies on linear landscape features to commute from roosts to feeding areas (Roche *et al.,* 2014).

106. The most recent population estimates for this species of bat is 14,975 individuals (2023), a cumulative increase of 17.09% from 2017 to 2023. In the long-term, Roche (2024) reports an annual increase of 2.36% from 1999 to 2023 or cumulative growth of 74.93% over the time period (based on the summer trend).

107. The mitigation measures detailed in Section 5.2 and in the Planning Application have been designed to meet this test. With those mitigation measures implemented, the construction of a bat house will provide suitable roosting conditions to support individuals commuting and forging in vicinity of the River Shannon (please see Annex A for Case Studies). In addition, measures will be followed to ensure that no bats are harmed during the demolition of Building 1.

108. The location of the proposed bat house for the Proposed Project is within an area north-east of the WTP (within the Project Boundary). A bat house was constructed by Clare County Council as part of bat mitigation measures for the Killaloe Bypass. This bat house was principally designed for Leisler's bat but provision was also constructed to facilitate roosting lesser horseshoe bats. Lesser horseshoe bats have been recorded roosting in the buildings during monitoring surveys. This roost is located 310m from the proposed bat house.

109. This species tends to commute along distinct linear habitat features such as stonewalls and hedgerows and avoids flying out in the open. It travels short distances from summer roosts to foraging areas, typically 2.5km. The proposed bat house is located within this typical commuting distance of the Clarisford Park Bat House and therefore will provide an 'auxiliary' bat roost for the local lesser horseshoe bat colony. Knight & Jones (2009) found that more than 75% of radio-tracked bats in their study used night roosts and these were typically buildings (the proposed bat house would be a suitable night and day roost). The number of night roosts used by a colony correlated with the core range of the maternity roost and night roosts are considered to be an essential component to allow bats rest between foraging periods and therefore an important conservation tool.

110. This bat species will typically feed on a range of insects including midges, craneflies, caddisflies, lacewings and moths (McAney, 2006). The BCIreland Irish Landscape Model indicates that the species' habitat preference is for areas with broadleaf and mixed woodland and that a mosaic of habitats is important (Roche *et al.,* 2014). The habitat in vicinity of the proposed bat house location provides foraging and commuting habitat which will allow any individuals roosting within the proposed bat house to commute north to the Clarisford Park Bat House or south towards larger known colonies further afield outside the typical maternity season. The proposed location of the bat house is also away from existing human habitation. This bat species has a preference to roost in un-occupied buildings (McAney, 2006), which the proposed bat house will be.

111. As such with the proposed mitigation measures as outlined in Section 5.2 in place, the provision of a new bat house located in ideal foraging habitat and the measures to ensure that the demolition of Building 1 will be undertaken with due care for bats, it is determined that there would be no detrimental effect to the maintenance of the populations of lesser horseshoe bat population at a favourable conservation status in their natural range.

### 6.3.2 All Other Bat Species

112. The following is a profile of each of the bat species recorded in roosts proposed to be impacted by the Proposed Project:

#### *6.3.2.1 Common pipistrelle*

- Common pipistrelle is an Annex IV bat species under the EU Habitats Directive. The status of this bat species is listed as Least Concern. The national common pipistrelle population is considered to be a significantly increasing trend (Aughney *et al.,* 2022)
- The modelled Core Area for common pipistrelle is a relatively large area that covers much of the island of Ireland (56,485km$^2$). The BCIreland Irish Landscape Model indicated that the common pipistrelle selects areas with broadleaf woodland, riparian habitats and low-density urbanization (<30%) (Roche *et al.,* 2014)
- The population estimates (2023 figures) indicate that the population is between 1,074,000 and 2,416,500 individuals and this this represents a 75.4% increase compared to 2012 population estimates (Roche & Langton, 2024).

113. The overall trend for the national population of common pipistrelle in Article 17 reporting (NPWS, 2019) is as follows:

- Range = Favourable
- Population = Favourable
- Habitat for species = Favourable
- Overall Assessment of Conservation Status = Favourable
- Overall trend in Conservation Status = Stable.

#### *6.3.2.2 Soprano pipistrelle*

- Soprano pipistrelle is an Annex IV bat species under the EU Habitats Directive. The status of this bat species is listed as Least Concern. The national soprano pipistrelle population is considered to be a significantly increasing trend (Aughney *et al.,* 2022)
- The modelled Core Area for soprano pipistrelle is a relatively large area that covers much of the island of Ireland (62,020km$^2$). The BCIreland Irish Landscape Model indicated that the soprano pipistrelle selects areas with broadleaf woodland, riparian habitats and low-density urbanisation (Roche *et al.,* 2014)
- The population estimates (2023 figures) indicate that the population is between 1,204,800 and 2,709,600 individuals and this this represents a 140.2% increase compared to 2012 population estimates (Roche & Langton, 2024).

114. The overall trend for the national population of soprano pipistrelle in Article 17 reporting (NPWS, 2019) is as follows:

- Range = Favourable
- Population = Favourable
- Habitat for species = Favourable
- Overall Assessment of Conservation Status = Favourable
- Overall trend in Conservation Status = Stable.

*6.3.2.3 Brown long-eared bat*

- Brown long-eared bat is an Annex IV bat species under the EU Habitats Directive. The status of this bat species is listed as Least Concern. The national brown long-eared bat population is considered to be stable (Aughney *et al.,* 2022)
- The modelled Core Area for brown long-eared bat is a relatively large area that covers much of the island of Ireland (49,929km$^2$). The BCIreland Irish Landscape Model indicated that the brown long-eared bat habitat preference is for areas with broadleaf woodland and riparian habitats on a small scale of 0.5km emphasising the importance of local landscape features for this species (Roche *et al.,* 2014)
- The population estimates (2023 figures) indicate that the population is between 65,200 and 102,000 individuals and this this represents a 5.18% increase compared to 2012 population estimates (Roche & Langton, 2024).

115. The overall trend for the national population of brown long-eared bat in Article 17 reporting (NPWS, 2019) is as follows:

- Range = Favourable
- Population = Favourable
- Habitat for species = Favourable
- Overall Assessment of Conservation Status = Favourable
- Overall trend in Conservation Status = Stable.

*6.3.2.4 Natterer's bat*

- Natterer's bat is an Annex IV bat species under the EU Habitats Directive. The status of this bat species is listed as Least Concern. The national Natterer's bat population is currently unknown
- The modelled Core Area for Natterer's bat is a relatively large area that covers much of the island of Ireland (52,864km$^2$). The BCIreland Irish Landscape Model indicated that the Natterer's bat selects areas with broadleaf woodland, riparian habitats and areas with larger scale provision of mixed forest (Roche *et al.,* 2014). Therefore, it is likely that this species is more widespread within the survey area.

116. The overall trend for the national population of brown long-eared bat in Article 17 reporting (NPWS, 2019) is as follows:

- Range = Favourable
- Population = Favourable
- Habitat for species = Favourable
- Overall Assessment of Conservation Status = Favourable
- Overall trend in Conservation Status = Stable.

117. Common pipistrelle and soprano pipistrelle are Ireland's most common bat species and this was confirmed by the large number of bat encounters of these two species recorded by surveys completed. A total of 15 common pipistrelle roosts and six soprano pipistrelles roosts were recorded while bat detector records were distributed throughout the survey area of the Proposed Project. A total of 93,230 soprano pipistrelle bat passes (50% of total bat passes recorded) were recorded which accounts for 91% of the static surveillance periods (133 of 146 surveillance periods). Common pipistrelle was the second most frequently recorded bat species and represented 34.8% of the total number of bat passes and was recorded during 131 (89.7%) of the static surveillance periods. Common pipistrelle (n=2,388 bat encounters, 42.9%) was the most frequently recorded bat species during other surveys completed (i.e. walking transects, dusk and dawn surveys) while soprano pipistrelle (n=1,732 bat encounters, 31.1%) was the second most frequently encountered bat species.

118. The Proposed Project will result in the loss of four tree roosts. These trees were recorded as night or small satellite roosts. In relation to the two tree roosts located at PBR 20, it was noted by the survey team that a greater number of individuals of these bat species were commuting from potential building roosts adjacent to the treeline. Therefore, the two tree roosts (PBR 20) are likely to be auxiliary roosts to the principal roosts in the area. Therefore, mitigation measures have been designed according Marnell *et al.* (2022) in relation to the importance of the roost type.

119. As such, with the proposed mitigation measures as outlined in Section 5.2 in place, the provision of alternative roosts (bat boxes) and the measures to ensure that the felling of trees will be undertaken with due care for bats, it is determined that there would be no detrimental effect to the maintenance of the populations of common and soprano pipistrelles bat population at a favourable conservation status in their natural range. Please see Annex A for the evidence relating to bat box usage by bats.

120. In relation to the two remaining bat species, Natterer's bat and brown long-eared bat, the roosts recorded were again day roosts for single bats. The national distribution of these two species is widespread (Roche *et al.*, 2014). In relation to the surveys completed, brown long-eared bats were recorded at a total of 130 discrete geo-referenced locations while Natterer's bats were recorded at 102 discrete geo-referenced location. In relation to static surveillance completed, brown long-eared bats were recorded on 50% of static unit locations (547 bat passes) and Natterer's bats were recorded on 39% of static unit locations (406 bat passes). Therefore, these two bat species are widely distributed within the project area and mitigation measures have been designed according Marnell *et al.* (2022) in relation to the importance of the roost type proposed to be lost.

121. As such with the proposed mitigation measures as outlined in Section 5.2 in place, the provision of a new bat house located in ideal foraging habitat and bat boxes to be erected in vicinity to tree roosts and the measures to ensure that the both demolition of Building 1 and felling of tree will be undertaken with due care for bats, it is determined that there would be no detrimental effect to the maintenance of the populations of both bat population at a favourable conservation status in their natural range.

# 7. Conclusions

122. This report provides supporting documentation for the application of a derogation licence for the disturbance of bats for the Proposed Project. The loss of one building roost and four tree roosts have been identified within the Proposed Project for which this derogation licence is sought '*In the interests of public health and public safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment',* whereby no satisfactory alternatives are available and where the Proposed Project will not be detrimental to the maintenance of the population of bats at favourable conservation status in their natural range.

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# Annex A

## Effectiveness of Bat Boxes as a Mitigation Measure

Two publications that provide good scientific advice in relation to the effectiveness of bat boxes are presented below. McAney & Hanniffy (2015) reviewed the use of bat boxes in Ireland in relation to the bat usage of the following bat box schemes: 62 Schwegler boxes of three models erected in Portumna Forest Park (Bat box scheme consisted of 30x 1FF design, 30x 2FN design and 2x 1FW design); 50 2FN boxes erected in Coole-Garryland Nature Reserve and 50 2FN boxes erected in Knockma Nature Reserve of which 40 were later transferred to Glengarriff Nature Reserve County Cork. The bat box schemes were set up in March 1999 and data was collected up to 2015. Eight of the nine resident bat species were recorded roosting in bat boxes (lesser horseshoe bats cannot use bat boxes due to their need to fly, rather than crawl, into roosts). The main summary points are as follows:

- Leisler's, brown long-eared and *Pipistrellus* spp. were recorded in boxes at all three Galway woods, Daubenton's bat was only recorded in Garryland, Natterer's bat was only recorded in Glengarriff and whiskered/Brandt's was recorded just twice
- There was a 31% chance of encountering a bat at Portumna Forest Park compared to 11.5% and 10% at Coole-Garryland Nature Reserve and Knockma Nature Reserve respectively
- *Pipistrellus* spp. preferred 1FF boxes as this bat box design offers crevice-like roosting conditions. This species group also showed a seasonal preference with more bats present later in the season (visual observations confirmed the bats were using the boxes as mating roosts) and their numbers increased from the time that the bat box scheme was originally established
- Brown long-eared bats preferred 2FN boxes that mimic holes in trees, the natural roosting sites for this species. This species also showed no seasonal pattern to their occurrence in the boxes. However, one aspect of 2FN boxes that this report mentions is the high occupancy by birds which can be an issue in relation to nesting material reducing the availability of bat boxes for roosting bats
- Leisler's bat showed no preference for box model but showed a seasonal preference with more bats present later in the season
- Aspect was not a significant factor for occupancy, but most boxes received dappled sunshine for part of the day
- The other factor that proved significant was the length of time the boxes were in place, with occupancy rates increasing for all three species, although in the case of pipistrelles this increase appears to have stabilised. So, although the boxes were occupied very quickly, it took several years before they were regularly occupied and before clusters of bats were formed and breeding was confirmed.

Collins *et al.* (2020) investigated the implementation and effectiveness of bat roost mitigation, which included bat boxes, in building developments completed between 2006 and 2014 in England and Wales. The bat species studied were: common and soprano pipistrelle, brown long-eared bat and *Myotis* species, all of which are present in Ireland. A summary of the main points relating to bat boxes are as follows:

- Bat boxes were the most frequently deployed roosting provision (i.e. alternative roosts), being installed at 64% (n = 71) of sites surveyed as a compensation or enhancement measure
- Box frequencies ranged from 1 to 41 at sites where they were installed, with an average of 6.6 boxes per site
- Bats, or evidence of bats, were recorded in 20% of these bat boxes
- Bat boxes mounted externally on buildings showed the highest occupation rate regardless of species. While common pipistrelle showed a preference for these over tree mounted boxes, the opposite was true for soprano pipistrelle
- The four most popular bat box models used by consultants in the study were all Schwegler woodcrete bat boxes. Bat presence was highest in the 1FF bat box design (32%, n = 53) and lowest for birds (8%). The tree-mounted 2F and wall-integrated 1FR/2FR models both demonstrated similar bat presence rates of 23% (n = 43) and 25% (n = 32) respectively. The 2FN tree-mounted model showed the lowest presence rate for bats (11%, n = 19) and the highest for birds (58%). There were also 26 timber bat boxes, none of which were used by bats.

The author has also erected a number of bat box schemes and, where possible, has completed occasional monitoring visits. One such example is a bat box scheme erected in Killeshandra, County Cavan, which consists of eight Schwegler woodcrete bat boxes of various designs. The bat boxes were erected on mature trees located in a linear woodland adjacent to a river. This bat box scheme was erected in 2012 as part of mitigation for the demolishment of a large derelict building where small satellite roosts were recorded for *Pipistrellus* spp. and Daubenton's bat. Two site visits have been completed since 2012 and during these visits the bat boxes were checked for evidence of bat usage. The first site visit was on 25/8/2015 and one bat box was occupied by a single Leisler's bat while the additional seven bat boxes had evidence of bat droppings (*Pipistrellus* spp. and *Myotis* spp.). During the second site visit (27/7/2019) four bat boxes were occupied by bats (soprano pipistrelle x1 individual (adult male), Leisler's bat x1 individual (adult male) and two bat boxes with x16 Daubenton's bats and x10 Daubenton's bats respectively). Biometrics was recorded for 12 of the bats (which included 10 of the Daubenton's bats recorded in the bat box with 16 individuals) and five of these Daubenton's bats were lactating females with the remaining five Daubenton's bats recorded as juveniles, thereby indicating that this bat box was used as a maternity roost. The remaining four bat boxes all had droppings within for *Pipistrellus* spp. and Leisler's bats. This bat box scheme, while just one example, demonstrates that when bat boxes are erected in an area with good bat habitat (bat survey documented a high level of bat activity for the named bat species), a high level of occupancy of bat boxes will occur. This bat box continues to be successful and monitoring of it in 2023 recorded three bat species. The exact numbers of individual bats for each bat species are present in the Table A.

**Table A: Results of Inspections of Killeshandra Bat Box Scheme, County Cavan (Source: Cavan Bat Group) SP = Soprano Pipistrelle; Leis = Leisler's Bat; Daub = Daubenton's Bat; Pip = Pipistrellus Species**

| Model | 28/01/2023 | 18/02/2023 | 26/03/2022 | 30/04/2023 | 13/05/2023 | 23/09/2023 |
|---|---|---|---|---|---|---|
| **Schwegler Woodcrete 2F** | 1cm *Pipistrellus* droppings | Fresh Pip droppings | No bat evidence | 9 Daubs | No bats, Daub droppings | No bats, 1cm of Daub droppings |
| **Schwegler Woodcrete 2F** | Old Leis bat droppings | Bird poo | No bat evidence | No bats | No bats, bird feathers | No bats, small amount of Leis bat droppings |
| **Schwegler Woodcrete 2F** | Unidentified droppings | Fresh Pip droppings and bird poo | No bat evidence and bird poo | Nest – cleaned out | Blue tit sitting on nest | No bats, no droppings |
| **Schwegler Woodcrete 2F with timber panel** | 5cm unidentified droppings | No bat evidence | No bat evidence | 1 Leisler's bat | Leis x1 (male, 13.5g, 41.2mm R forearm, 41.6mm L forearm). | No bats, 1cm of Leis bat droppings |
| **Schwegler Woodcrete 2F with timber panel** | 5 soprano pipistrelles (semi-torpor), 2cm droppings | 4 Soprano pipistrelles | 12 Daub | 2 Daubs, 4 escaped (biometrics) | x4 Daubs, droppings | 13 Daub |
| **Schwegler Woodcrete 2F with timber panel** | 3cm unidentified droppings | Daubenton's bat droppings | 1 Leis, 4 SP, 5 Daub | 6 Daubs | x7 Daubs (not processed), droppings | 17 Daub |
| **Schwegler Woodcrete 2F** | Bird's nest | Fresh Pip droppings | No bat evidence | 11 Daubs | No bats, Daub droppings | Bird's nest (removed) |
| **Schwegler Woodcrete 2F** | 3cm unidentified droppings | Start of bird's nest | No bat evidence | Nest – occupied by blue tit | Nest – occupied by blue tit | No bats, 4cm of Daub droppings |
| **Woodstone Chilton** | 2 *Pipistrellus* droppings | No bat evidence | No bat evidence | No bats | No bats | No bats, no droppings |
| **Woodstone Chilton** | No evidence | No bat evidence | No bat evidence | No bats | No bats | No bats, no droppings |

| Model | 28/01/2023 | 18/02/2023 | 26/03/2022 | 30/04/2023 | 13/05/2023 | 23/09/2023 |
|---|---|---|---|---|---|---|
| **Woodstone Chilton** | No evidence | No bat evidence | No bat evidence | No bats | No bats | 1 SP |
| **Woodstone Chilton** | No bat evidence | No bat evidence | No bat evidence | No bats | No bats | No bats, no droppings |
| **Woodstone Harlech** | Non-applicable | Erected on 18/2/2023 | No bat evidence | No bats, x1 pipistrelle bat dropping | No bats | 3 SP |
| **Woodstone Harlech** | Non-applicable | Erected on 18/2/2023 | No bat evidence | 1 soprano pipistrelle | No bats | No bats, no droppings |
| **Schwegler Woodcrete 2FN** | Non-applicable | Erected on 18/2/2023 | No bat evidence | No bats | No bats, pip droppings | No bats, unidentified bat droppings |
| **Schwegler Woodcrete 1FF** | Non-applicable | Erected on 18/2/2023 | No bat evidence | 1 soprano pipistrelle | No bats | 1 Leis |

In relation to bat boxes, Marnell *et al.* (2022), a document that provides guidelines that are considered to be practical and effective based on past experience, recommends that the design life of potential bat boxes, including essential maintenance, should be about 10 years, as this would be comparable with the lifespan of the tree roosts that bat boxes are designed to mimic. The guidelines continue by stating, '*This lifespan can be achieved with good quality wooden boxes and exceeded by woodcrete bat boxes or other types of construction that ensure any softwoods are protected from the weather and attack by squirrels*' (note – this includes woodstone bat boxes).

In relation to the number of bat boxes recommended to be erected, Lintott & Mathews (2018) found that the greater the number of bat boxes deployed, the greater the probability of at least one of the boxes becoming occupied. The odds of bats occupying at least one box increased by approximately 7% with each additional bat box that was deployed.

Therefore, woodcrete bat boxes are recommended as a bat mitigation measure, and the author's preference is to use 1FF designs as this box is open at the bottom which reduces build-up of droppings (i.e. it is a self-cleaning bat box). Both McAney & Hanniffy (2015) and Collins *et al.* (2020) demonstrated usage of this bat box design by bat species recorded in this survey report. In addition, the author has a preference for 2F and 2FN bat boxes as these two designs are also regularly used by common Irish bat species. Evidence of usage in relation to the larger summer bat boxes is being collated by Bat Eco Services as this box has been used in a number of new schemes to-date.

To increase occupancy of bat boxes by bats it is important to erect bat boxes 4m or higher (to ensure that bat boxes are out of reach from disturbance by humans and predation by other mammals) and that they should be located where bats have been documented foraging and commuting. The aspect of the bat box is not an influencing factor in relation to occupancy. These recommendations have all been implemented in the erection of the Ramparts Bat Box Scheme.

**Plate 1a: Cluster of Soprano Pipistrelles in a 2F Woodcrete Bat Box (12/9/2024)**

**Plate 1b: Daubenton's Bats in a 2F Woodcrete Bat Box, Killeshandra, County Cavan**

## Bat Houses

### Bat Eco Services Evidence

The bat mitigation measures follow Marnell *et al*. (2022) to ensure that conservation of the bats is of paramount importance. The design of the bat mitigation measures follows Schofield (2008), the primary handbook for the renovation of buildings as bat houses for this species of bat. This handbook has been used by Bat Eco Services in the renovation of 10 successful bat houses for lesser horseshoe bat to-date.

The below scientific paper published by the principal bat specialist provides details of one of the first bat houses that she consulted on and monitored:

**Aughney, T., Stephens, R. & Roche, N. (2021) Monthly roost counts of Lesser Horseshoe Bats (Rhinolophus hipposideros (Bechstein)) in a purpose-renovated building in County Galway. Irish Naturalists' Journal 37 (2):137-141.**

This paper provides evidence of how improving a bat house for lesser horseshoe bats can greatly increase the colony size utilising the structure. Garryland Lodge provided roosting for 8-16 lesser horseshoe bats in the years prior to the renovation of the building, increasing to >200 adults in the counts reported in the paper. In the most recent counts undertaken by NPWS Regional staff, these numbers have increased further (2024 – 304 bats, Source: NPWS Lesser Horseshoe Bat Database).

Bat Eco Services, through a number of derogation licence reports, has provided evidence of successful renovation works to buildings as bat roosts and the construction of new bat houses. Two such projects, for reference, were completed in 2024 and are as follows (reports issued to NPWS Wildlife Licensing in December 2024):

1. Main Bat House & New Bat House, Waterville, County Kerry (DER-BAT-2024-177)
2. Oldstreet Bat House, County Galway (DER-BAT-2024-181).

The latter bat house was designed with bat tubes incorporated into the external walls. Monitoring of the bat house has recorded soprano pipistrelles and Leisler's bats roosting in the bat tubes, while common pipistrelle roosts in the roof space and access this via the bat slates incorporated into the roof.

Bat Eco Services Ltd. has also overseen the construction of bridges with the incorporation of bat tubes. Monitoring of such has recorded Daubenton's bats roosting in the bat tubes post works (e.g. Ross Bridge, County Clare).

**VWT Pump House**

The design of the daytime roost structure (or Pump House bat house) for lesser horseshoe bats will be based on the VWT Pump House (or daytime roost) design. This bat house design was trialled as part of the Mulkear EIP Project, the VWT designed a day roost, six of which were constructed on farmland. During the 2025 Lesser Horseshoe Bat Open Day, lesser horseshoe bat occupancy was recorded in one of the bat houses with additional bat species also using the bat house (*Pipistrellus* species).

In addition, a similar lesser horseshoe bat day roost construction was also successfully undertaken by NPWS Regional Staff in County Cork.

In relation to this project, the opportunity will be made to include bat tubes in the external walls to provide alternative roost for all other bat species. Monitoring of the Oldstreet Bat House has recorded soprano pipistrelles and Leisler's bats roosting in the bat tubes while Daubenton's bat have been recorded roosting in bat tubes inserted in a number of bridge projects completed by Bat Eco Services. A colony of soprano pipistrelles were also recorded roosting in bat tubes incorporated as part of the Bective Bat House.

**Plate 2: VWT Lesser Horseshoe Bat Daytime Roost (Photo: VWT, Ireland)**

**Plate 3: Oldstreet Bat House (External Front View with 1FR Bat Tubes) with Boundary Hedge Planting**